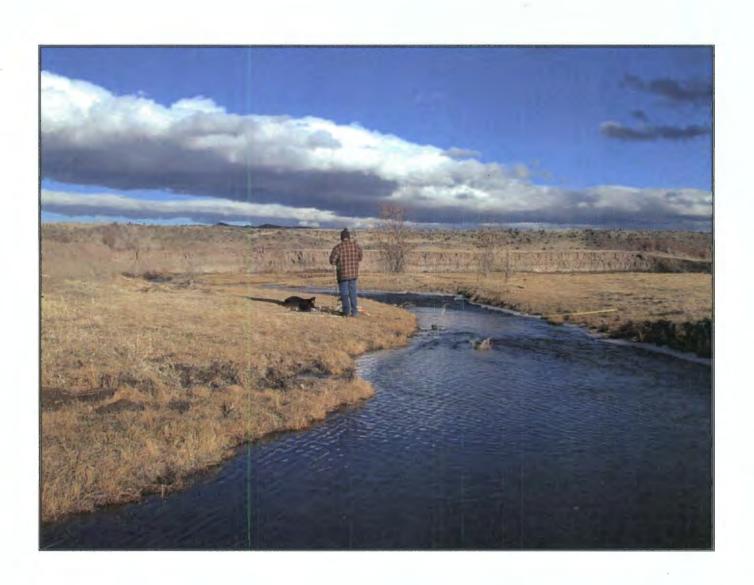


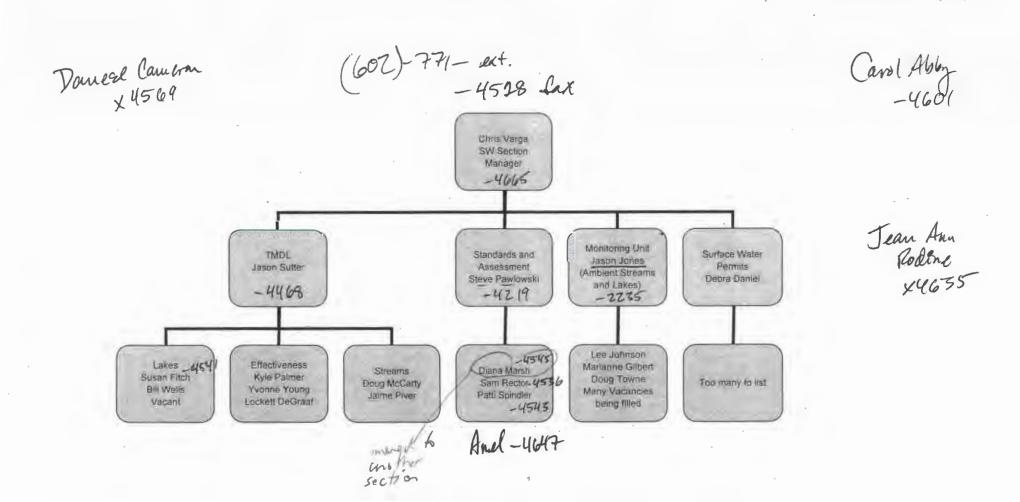
Janet Napolitano, Governor Stephen A. Owens, ADEQ Director

2006 STATUS OF AMBIENT SURFACE WATER QUALITY IN ARIZONA

Arizona's Integrated 305(b) Assessment and 303(d) Listing Report

DRAFT February 2007







Peter Kozelka/R9/USEPA/US

03/13/2007 08:24 AM

To Laura Bose/R9/USEPA/US@EPA

cc Jared Vollmer/R9/USEPA/US@EPA

bcc

Subject Re: AZ 2006 draft list

History:

This message has been replied to.

you can also find hardcopy of our 2004 decision in the box on my cube floor. AZ 2004 report is on top.

in box you will find brown folder with various letters and RTC for our 2004 decision.

there are 3 general cases when we have added waters to AZ:

- -fish tissue
- -toxics with more than once in three years on average
- -conventionals with n=20 or less and there are sufficient exceedences to indicate impairment; e.g., 5 hits out of 11 samples.

comprendo?!!

leave me msg.

ADE Q Surface Water Section

Revised: 12/18/06

(6.02) 771-		Revised
Water Quality Di	ivision	
Name	Ext.	Lan Id.
Joan Card, Director	1-2306	JC10
Linda Taunt, Deputy Director	1-4416	LCT
Jo Williams, Adm. Asst. III	1-4496	JMW
Ophelia Begay, Adm. Sec. III	1-2303	OB1

Surface Water Section					
Name	Ext.	Lan Id.			
Chris Varga, Env. Prgm. Manager	1-4665	CRV			
Danese Cameron, Adm. Sec. II	1-4569	DNC			
Shaunel Wytcherley, EHS II	1-4472	SW4			
Dennis Turner, Exc. Conslt. II	1-4501	DT1			
Greg Olsen, Hydro. IV (928)	773-2730	GSO			

Total Maximum Daily Load Unit				
Name	Ext.	Lan Id.		
Jason Sutter, Env. Prgm. Sup.	1-4468	JS9		
Susan Fitch, Hydro. III	1-4541	STF		
Bill Wells, EPS	1-4542	WEW		
Lockett Degraaf, EPS	1-4243	LD1		
Jamie Piver, EPS	1-4546	JLP		
Yvonne Young, EPS	1-4549	YY1		
Kyle Palmer, Hydro. III	1-4540	KWP		
Doug McCarty, Hydro. III	1-4521	DM4		
Don Buchanan, EPS	1-4470	DB10		

Monitoring Unit					
Name	Ext.	Lan Id.			
Jason Jones, Env. Prgm. Sup.	1-2235	JDJ			
Marianne Gilbert, EHS II	1-4563	MCG			
Douglas Towne, Hydro. III	1-4412	DCT			
Lee Johnson, EPS	1-4520	LWJ			
Lin Lawson, Hydro. III	1-4247	LLL			
Meghan Smart, EPS	1-4520	MS14			
Karyn Hanson, Hydro. III	1-4164	KH4			
John Woods, EPS	1-4471	JOW			
Aiko Condon, EPS	1-4539	AC3			

Permits Unit				
Name	Ext.	Lan Id.		
Debra Daniel, Env. Progm. Sup.	1-4689	DD2		
Betty Lehman, Adm. Sec. I	1-4633	BLL		
Reza Azizi, Env. Eng. Spec.	1-4593	MRA		
Lavinia Wright, EPS	1-4585	LW4		
Jacqueline Maye, EPS	1-4607	JPM		
Denise Nelson, EPS	1-4675	DN1		
Shirley Conard, EPS	1-4632	SC4		
Kim Lincoln, EPS	1-4376	KL1		
Sondra Francis, EPS	1-4666	SMF		
Sara Konrad, EPS	1-4449	SK2		
Ingrid Clark, Env. Eng. Spec.	1-4678	ILC		
Edwina Vogan, EPS	1-4606	EMV		
Julie Finke, P&PS II	1-4568	JAC		
Helen Fernandez, Exam Tech	1-4868	HIN		
Vicki Rogers,	1-4592	VIR		
WQD Planning Sect	ion (Gn	n+s/		
Name	Ext.	Lan Id.		

Nama	I Evt	Lan Id.
Name	Ext.	
Steven Pawlowski, Env. Prgm. Sup.	1-4219	SEP
Patti Spindler, EPS	1-4543	PHS
Bob Scalamera, Hydro. III	1-4502	RS3
Diana Marsh, EPS	1-4545	DKM
Sam Rector, EPS	1-4536	SMR
Anel Avila, EPS	1-4647	AA1
Kurt Ehrenburg, EPS	1-4462	KE1
Helpful Information	Ext.	
Copy Center - AOT	1-2245	
Info. Desk (Sandy Cario)	1-7638	
Mail Room	1-4720	1
Supply Room	1-4820	1
Lab	1-2240	1
Conference Rooms	Ext.	
5100B (Fish Bowl)	1-4113	
5430B	1-4231	1
5430C	1-4806	1
5515B	1-4819	1
5515C	1-4852	1
Conference Meet On Number - ADOA	(602) 542-	4900

Helen Fernandez, Exam Tech	1-4868	HIN
Vicki Rogers,	1-4592	VIR
WQD Planning Section	n (60	ints/
Name	Ext.	Lan Id.
Carol Aby, Section Manager	1-4601	CMA
Mel Hessel, EPS	1-4571	MM4
Marita Nickerson, EHS II	1-4474	MGN
Sue Rice, Planner II	1-4514	SCR
Bertha Thomas, Adm Sec. II	1-4630	LBL1
Mahota Hadley, Planner III	1-4602	MJH
Karen Black, Adm. Asst. III	1-4559	KLB
Patti Majlish, Adm. Servc. Officer II	1-4558	PGM
Adrieanna Peralta, Planner II	1-4604	AP2
Grants and Outreach U	nit .	
Jean Ann Rodine, Grant & Outreach Sup.	1-4469	JR4
Becky Followill, Grant Coordinator	1-4635	RMS
Elizabeth Boettcher, Project Manager	1-4565	EJB
Krista Osterberg, EPS	1-4551	KO1

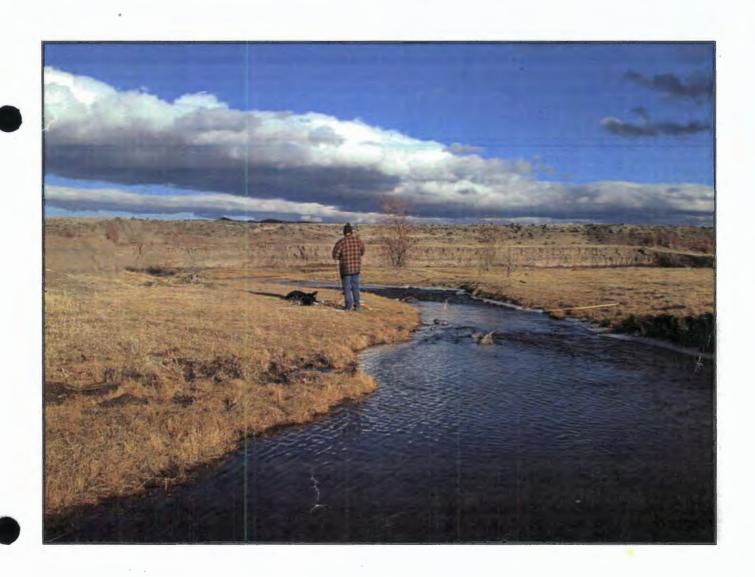


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Listing Report

DRAFT February 2007



	Approved by:
	Joan Card, Director, Water Quality Division
	Chris Varga, Surface Water Section Manger
	Jason Jones, Monitoring Unit Supervisor
	Jason Sutter, TMDL Unit Supervisor
Steve F	Pawlowski, Standards and Assessment Unit Supervisor

DRAFT 2006 Status of Surface Water Quality in Arizona

Arizona's Integrated 305(b) Assessment and 303(d) Listing Report

Drafted by:

Diana Marsh, Watersheds and Assessment Program

Editing, Graphics, and Database Assistance:

Anel Avila, Steve Pawlowski, Lisa Rowe, Jason Sutter, Linda Taunt,
Patti Tuve, Chris Varga, and Yan Zhao

A special thanks to ADEQ's monitoring staff who traveled across the state collecting the data used in this report:

Amanda Fawley, Susan Fitch, Tim Franquist, Jennifer Hickman, Lee Johnson, Lin Lawson, Doug McCarty, Greg Olsen, Patsy Olsen, Kyle Palmer, Jamie Piver, Samuel Rector, Robert Scalamera, Patti Spindler, Jason Sutter, Doug Towne, and R. Scott Williams

CHAPTER I INTRODUCTION AND PURPOSE

Every two years, the Arizona Department of Environmental Quality (ADEQ) is required by the federal Clean Water Act to conduct a comprehensive analysis of water quality data associated with Arizona's surface waters to determine whether state water quality standards are being met and designated uses are being supported. This integrated surface water assessment and impaired waters listing report (2006 Assessment Report) serves three functions.

- Nationally, it fulfills a reporting requirement of the Clean Water Act, and is submitted to the Environmental Protection Agency (EPA), and used to report on national water quality issues and concerns.
- For ADEQ, it provides a mandate to compile environmental data and information from ADEQ's
 surface water quality protection programs, as well as from other agencies, organizations, and
 individuals. This comprehensive evaluation of quality of water in Arizona is used to set priorities,
 allocate resources, and make decisions about land use activities, discharges to the water, future
 monitoring, and program initiatives.
- For the public, it provides an opportunity to learn about and comment on the status of surface water quality in the state.

Surface Water Assessment Methods and Technical Support

ADEQ has created a separate assessment methods document. It is assumed that the reader will obtain and reference this technical support document when using the information in this assessment and listing report, as assessment methods and criteria will not be repeated here.

The Assessment Methods and Technical Support document provides a description of the assessment process and specific assessment and impaired water listing criteria. It also provides information about the monitoring data and information used in this assessment and Arizona's credible data requirements. The three appendices provide: surface water quality standards used in the assessment, Arizona's TMDL statute, and the Impaired Water Identification Rule.

This document can be downloaded from ADEQ's web site at: http://www.azdeq.gov/environ/water/assessment.

Report Overview

Chapter I - Introduction and Purpose

Chapter II - Assessments of individual surface waters, organized by watershed

Chapter I-5

Chapter III - Summary Information

Chapter IV - Action Plan

Annotated References

Appendix A - Look up table of surface waters, indicating the watershed

Appendix B - Assessment Category Lists

Appendix C - Impaired Water Schedule and Prioritization

Appendix D - Critical Conditions

Appendix E - Delisting Impairments

Although an attempt was made to avoid technical jargon and unnecessary abbreviations, this is a technical report. Acronyms and terms used in the assessment report are defined in the Assessment Methods and Technical Support document (draft 2006).

Changes Affecting the Assessment Process

Although ADEQ has proposed revisions to surface water quality standards and the Impaired Water Identification Rule, this assessment does <u>not</u> reflect any changes in either of these rule packages. The assessment is using the same rules that were in effect for the 2004 assessment. However, the following changes and clarifications in federal guidance for completing assessments and listings were incorporate in this assessment:

- Evidence of whether a sample represents a 4-day period, such as hydrologic stability, should be
 evaluated where available, when using a grab sample to represent chronic aquatic and wildlife
 conditions.
- An assessment unit can be listed in multiple categories when a TMDL has been completed on some pollutants, but not all pollutants causing impairment.
- When listing an impaired assessment unit in Category 4B, based on alternative pollution control requirements, the state must provide substantial supporting evidence of a regulatory commitment to bringing the surface water into compliance with its standards.

The Surface Water Assessment Methods and Technical Support document describes how these changes were implemented in this assessment. Further revisions of the Impaired Water Identification Rule are required to establish any of these as listing or delisting requirements.

Chapter I- 6 Draft February 2007 Publication Number: EQR 07-02

CHAPTER II WATER QUALITY ASSESSMENTS BY WATERSHED

Assessments are reported alphabetically by individual assessment units in this chapter and grouped by the 10 watersheds, as illustrated on the following map: Bill Williams Watershed, Colorado – Grand Canyon Watershed, Colorado – Lower Gila Watershed, Little Colorado Watershed, Middle Gila Watershed, Salt Watershed, San Pedro Watershed, Santa Cruz Watershed, Upper Gila Watershed, and Verde Watershed

Map of watersheds			

If the reader is uncertain about which watershed to look in for assessment information, an alphabetical listing of surface waters assessed is provided in **Appendix A**.

Assessment Information

A summary page is provided for each assessment indicating:

- Designated use support and an overall assessment
- Impairment status and pollutant causing impairment (if applicable)
- Monitoring used in the assessment
- Exceedances
- Data gaps and monitoring priorities.

The data gaps and monitoring needs information provides the "Planning List" information used to prioritize future monitoring. Surface waters not assessed are also included in the general planning list, as the lack of data to support assessments is a reason to be placed on ADEQ's internal Planning List.

The reader should refer to the Surface water Assessment Methods and Technical Support document for information concerning the assessment process, determining exceedances, assessment criteria, assessment categories, and monitoring prioritization criteria.

Watershed Information

General background information and a few maps are provided for each watershed to provide some context for the assessments. One map (or a series of maps) shows the assessed surface waters and the monitoring sites used in this assessment. The watershed reports also provide descriptions of TMDLs, water quality improvement projects, and other studies that have been initiated or completed since 2000.

Ch. 3 -Summary Info

CHAPTER III SUMMARY INFORMATION

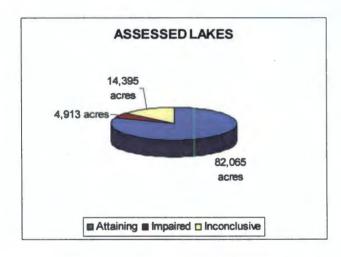
This chapter provides a summary of assessed surface waters. Progress and comparisons with previous assessments are illustrated in the following chapter. Statewide summary statistics can provide a general sense of the status of water quality in Arizona.

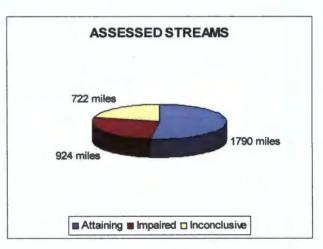
The assessments and statistics in this chapter exclude surface waters on Indian Lands.

Attaining or Impaired Waters

Assessed Waters 2006

USE SUPPORT CATEGORY	LAKES (Acres)	STREAMS (Miles)	
Attaining Uses (Category 1 and 2)	82,065	1,790	
Impaired (Category 4 and 5)	4,913	924	
Inconclusive (Category 3)	14,395	722	
Total Assessed	101,373	3,436	
Total Assessed as Attaining or Impaired (excluding Category 3)	86,978	2,714	





About 82% of the lake acres and 52% of the stream miles assessed are attaining their uses.

If sites had been randomly selected across the state, this could be used to infer water quality throughout Arizona. However, sites are <u>not</u> randomly selected. They were selected by different programs and agencies for a variety of purposes, some with a bias towards finding pristine or impaired conditions. Therefore, inferences about water quality in general in Arizona should be limited. (See future monitoring discussion in Chapter IV.)

Designated Use Support — Narrative and numeric criteria were developed to protect uses shown to be occurring on a surface water — aquatic life, swimming, fishing, drinking water supply — therefore, designated use support should indicate whether our water is safe for use. (See explanation of standards

Summary Information

Chapter III - 1

Draft February 2007

Publication Number: EQR 07-02

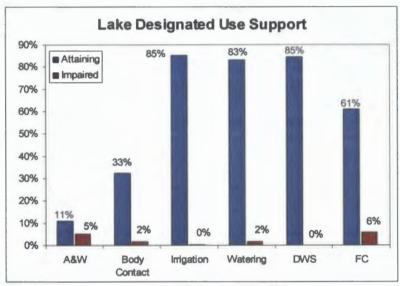
and designated uses in the Assessment Methods document.)

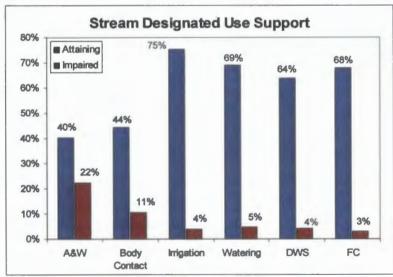
The following table and graph illustrate the relative use support for each of the designated uses.

Designated Use Support Statistics – 2006
(Will revise statistics after draft review)

SUPPORT TYPE		LAKES			STREAMS	
	Attaining (acres)	Impaired (acres)	Total (acres)	Attaining (miles)	Impaired (miles)	Total (miles)
Aquatic and Wildlife						
Fish Consumption						
Body Contact						
Domestic Water Source						
Irrigation						
Livestock Watering						

^{*}Total miles and acres include miles and acres assessed as "inconclusive."





These statistics can be used to answer the following questions:

• Is it Safe for Aquatic and Wildlife Uses? — Aquatic life is most at risk due to degraded water quality, as the fish and other aquatic critters are living in the water. This is reflected in surface water quality criteria, as water quality criteria are frequently more protective (lower criteria were established) than even human health criteria. In this assessment, therefore, the aquatic life use has the lowest percentage of attainment and the highest percentage of impairment. This indicates that protection of aquatic life is generally fair in the waters assessed as 11% of the lakes and 40% of the streams are attaining this use. However, these water quality criteria are the most likely to be exceeded and result in impairment — 5% of the lakes and 22% of the streams.

Several large reservoirs were assessed as inconclusive when it came to this use, resulting in an unusually low proportion of attaining and impaired lake acres. These reservoirs, Lake Mohave, Lake Powell, Lake Havasu, and Roosevelt Lake, account for nearly 80% of assessed lake acres. Lakes Mohave and Havasu in the Colorado-Lower Gila watershed were inconclusive due to selenium concerns, while Lake Powell in the Colorado-Grand Canyon lacked core parameter monitoring. Roosevelt Lake in the Salt watershed lacked core nutrient parameters. More monitoring is planned for all of these reservoirs, and new narrative nutrient implementation guidance will be applied to the Salt River reservoirs by the next assessment.

When it comes to streams, the primary cause of impairment was selenium, which can be found in local bedrock at natural high levels in some areas of the state. More studies will be done in association with TMDL development to determine whether or not the loadings are natural.

Is it Safe to Swim in the Water? — Full Body Contact (swimming) or Partial Body Contact (wading) was shown to be attaining in 28.6% of the lakes and 46.0% of the streams assessed. The cause of impairment for this use in 10.9% lakes and 50.7% of streams is due primarily to Escherichia coli bacteria contamination.

Studies suggest that swimming should be avoided during storm water runoff and in stagnant water where bacteria contamination is likely. Waters classified as "effluent dependent waters" and many shallow urban lakes are also not designated for swimming or even wading.

Routine bacteria monitoring occurs at a few frequently visited swimming areas:

- Slide Rock State Park on Oak Creek.
- · Beaches along Lake Havasu,
- · Beaches along Lake Powell, and
- The Salt River Recreation Area (for part of this assessment period).

Of these monitored beaches, only Slide Rock state Park closed for swimming during the assessment period due to bacterial contamination. Slide Rock closes its swimming area when sampling results exceed water quality standards and the area remains closed until standards are met. (See TMDL discussion in the Verde Watershed.)

• Should We Eat The Fish? — Fish consumption advisories have been issued in 12 areas (see table below). These advisories are issued to inform the public about possible adverse health effects and they contain recommendations for how many fish meals can safely be consumed. Advisories may be directed at a specific subset of the population because some people are at greater risk (pregnant women and children). Additional information about fish tissue screening and fish advisories can be obtained by contacting ADEQ at (602) 771-4536 or Arizona Game and Fish Department at (602) 789-3260.

Fish Consumption Advisories (2006)

Summary Information

Chapter III - 3

SURFACE	SIZE	POLLUTANT AND	ADVISORY AND DATE ISSUED
WATER		PROBABLE SOURCES	
		Bill Williams Water	
Alamo Lake	1414 acres	Mercury. Mining and atmospheric deposition	2004. Meal = up to 8 ounces of largemouth bass or black crappie Children under age 6: no consumption Women of childbearing age: 1 meal/month Women not childbearing age: 5 meals/month Adult men: 6 meals/month
Coors Lake	229 acres	Mercury. Mining and atmospheric deposition.	2004. Meal = up to 8 ounces of largemouth bass or black crappie Children under age 6: no consumption Women of childbearing age: 1 meal/month Women not childbearing age: 5 meals/month Adult men: 6 meals per month
		Colorado - Lower Gila	
Painted Rock Borrow Pit Lake	185 acres	DDT metabolites, toxaphene, and chlordane from historic pesticide application on agricultural lands.	1991. Do not consume fish and other aquatic organisms
		Little Colorado Wate	ershed
Lake Mary, Upper & Lower	1625 acres	Mercury. Atmospheric deposition	2002 Do not consume walleye fish and limit consumption of other fish to one 8-ounce fillet per month.
Long Lake	594 acres	Mercury. Atmospheric deposition	2003. Do not consume fish.
Lyman Lake	1500 acres	Mercury. Atmospheric deposition.	2004. Meal = up to 8 ounces fish Children under age 6: no consumption Women of childbearing age and children under age of 16: 1 meal/month Women not childbearing age: Consult health care provider Adult men: 5 meals/month
Soldiers Lake	28 acres	Mercury. Atmospheric deposition	2003 Do not consume fish
Soldiers Annex Lake	122 acres	Mercury. Atmospheric deposition	2003. Do not consume fish.
		Middle Gila Water	shed
Painted Rocks Reservoir	100 acres	DDT metabolites, toxaphene, chlordane from historic pesticide application on crops	1991. Do not consume fish and other aquatic organisms
Portions of the Gila, Salt, and Hassayampa rivers	140 miles	DDT metabolites, toxaphene, chlordane from historic pesticide application on crops.	1991. Do not consume fish and other aquatic organisms
Dysart Drain (drains to Agua Fria River in Phoenix metropolitan area)	3 miles	DDT metabolites. From historic pesticide application on crops.	1995 Do not consume fish or other aquatic organisms.
		Santa Cruz Water	shed
Arivaca Lake	120 acres	Mercury. Mine tailings and atmospheric deposition	1996. Do not consume fish or other aquatic organisms.
Parker Canyon Lake	130 acres	Mercury. Sources to be investigated.	Women of childbearing age and children under 16: no consumption Women not of childbearing age: Consult health care provider. Adult men (above 15): Up to five 8-ounce meals/month.
Pena Blanca Lake	50 acres	Mercury. Sources historic mining and atmospheric deposition	1995 Do not consume fish or other aquatic organisms.

A national fish consumption advisory has also been issued by EPA. This advisory recommends that pregnant women (or who may become pregnant), nursing mothers, and young children should limit fish consumption. The women should limit fish to one six-ounce meal per week (8 ounces uncooked fish) and the young children to one two-ounce meal per week. (See further discussion of mercury later in this chapter.)

Can We Drink the Water? – Of the waters assessed, only 0.04% of the lakes and 4.61% of streams were impaired and 83.2% of the lakes and 69.2% of the streams were attaining this use. Keep in mind that these samples were of the source water (the raw water) and do not reflect the quality of water being provided at the tap to the customer. At a minimum, surface water must be disinfected and filtered before it is used for drinking.

The quality of water delivered by public water systems is strictly regulated and monitored to ensure that federal and state standards established to protect public health are met. Drinking water advisories are issued by the supplier when monitoring confirms that a drinking water standard has been exceeded. Contact the supplier to request a consumer confidence report to learn more about the quality of your public drinking water system.

When water is supplied by a private water system (a system serving fewer than 15 connections and 25 people), it is the user's responsibility to test and protect the quality of their drinking water. General water quality information and ways to protect drinking water sources can be obtained by contacting a county health department.

Never drink untreated lake or stream water. At a minimum, back packers must filter and disinfect the water before drinking it.

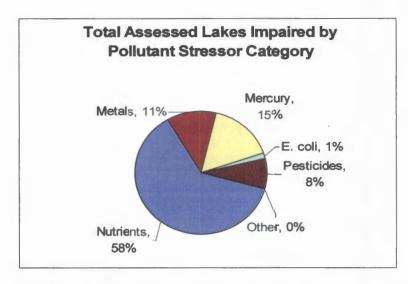
Pollutants Causing Impairments and Probable Sources – The pollutants causing impairments are summarized in the following table and graphs.

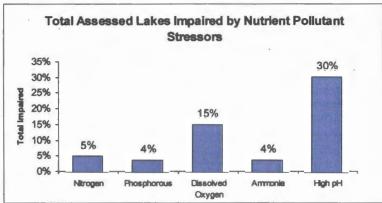
Pollutants or Stressors Causing Impairments in 2006

(Will revise statistics after draft review)

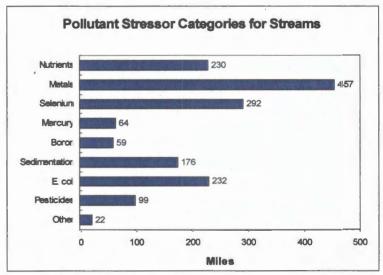
POLLUTANT STRESSOR CATEGORY	LAKES (acres)	STREAMS (miles)
Nutrients (nitrogen, phosphorus, high pH, dissolved oxygen, or ammonia)	9,007	
Metals (cadmium, chromium, copper, lead, silver, zinc or low pH) (Excluding mercury, boron, selenium)	205	
Selenium	0	
Mercury	5,341	
Boron	0	
Suspended sediment, turbidity, or sedimentation	0	
E. coli bacteria	12	
Pesticides (DDT metabolites, chlordane, and toxaphene)	285	
Other (Nitrate from explosives and chlorine)	0	

^{*}Cannot total miles or acres because some waters are impaired by multiple stressors





*A high percentage of Arizona's lakes are stressed by nutrient pollutants. The primary cause of impairment for lakes is high pH and the natural alkalinity of Arizona's surface waters may be contributing to this cause.



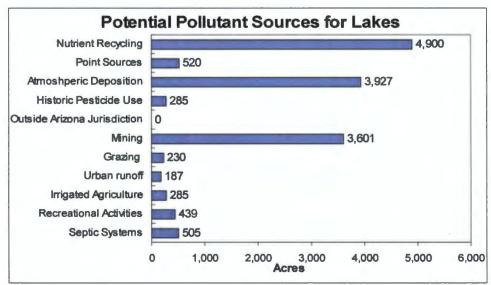
Based on past investigations, the probable sources contributing significant loadings are shown in the following tables and graphs. More than one source may be impacting a given stream reach or lake. These statistics are based on best available information, knowledge of land uses and activities in the watershed, and geology of the watershed.

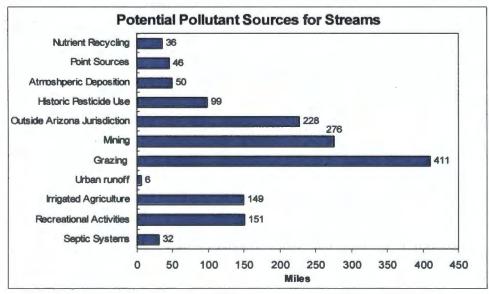
Probable Sources of Impairments in 2006

(Will revise statistics after draft review)

POLLUTANT SOURCE	LAKES (acres)	STREAMS (miles)
Septic systems	505	
Recreational activities	439	
Irrigated agriculture	285	
Urban runoff	187	
Grazing (historic and current)	230	
Mining (abandoned, inactive, and active)	3,601	
Outside Arizona Jurisdiction	n/a	
Historic pesticide use	285	
Atmospheric deposition	3,927	
Point Sources	520	
Nutrient recycling	4,900	

^{*}Cannot total miles or acres because some waters are impaired by multiple sources





Nutrient-related Impairments and Sources

Low dissolved oxygen and high pH are generally related to nutrient enrichment problems in lakes. Excess nutrients (nitrogen and phosphorus) can result in eutrophic or even hyper-eutrophic conditions, with high concentrations of algae and aquatic weeds during highly productive summer days. These conditions negatively impact recreational activities such as swimming and boating. If the algae suddenly die off, the resulting dissolved oxygen sag and high pH can result in fish kills. Excess algal growth can also impair public water supplies by imparting taste and odor problems, or by resulting in high concentrations of algal toxins.

Recent TMDL investigations have shown that the primary sources of nutrients affecting lakes and streams in Arizona are:

- Inadequate septic systems
- Inadequate toilet and waste disposal facilities in recreational areas
- Attached to sediments being transported in from the watershed (from grazing, wildlife, urban development, irrigated crop production)
- Animal wastes near the surface water (dog droppings, geese and ducks).

The potential for excess nutrient problems is further exacerbated by natural conditions, such as sunny days and hot temperatures that increase algae and aquatic plant production, nutrient cycling in the lake, and even shallow lake design and maintenance.

Pathogen-related Impairments and Potential Sources

ADEQ uses *Escherichia coli* (*E. coli*) bacteria as an indicator of pathogens in the water. While pathogens occur naturally in the environment, high concentrations of *E. coli* in waters used for swimming or even wading can pose a threat to human heath.

Pathogens are frequently attached to sediment; therefore, water with heavy sediment loads is likely to have high levels of pathogens. Flood waters carry pathogens into our surface waters at high concentrations; therefore, swimming should be curtailed during runoff events. Murky, sediment loaded water, is also difficult to effectively disinfect for drinking water purposes. This can be a problem for public systems using surface waters or for backpackers who need to filter and disinfect the water for drinking purposes.

The sources of Escherichia coli and other pathogens are generally the same as the sources of nutrients

discussed above: inadequate septic systems, inadequate toilet and waste disposal facilities at recreational areas, sediments, animal wastes attributed to grazing, dog droppings, ducks and other animals being fed at lakes. Watershed control strategies frequently focus on restoring natural vegetation filters, reducing erosion and sedimentation, improving waste management, and improving septic systems.

Sediment-related Impairments and Potential Sources

Arizona adopted a suspended sediment concentration (SSC) standard in 2002 to replace its turbidity standard. The SSC criterion is intended to protect fish coldwater and warmwater aquatic communities in perennial streams. Because sediments also contain the other



Big Sandy River Storm Flow

Summary Information

Chapter III - 8

pollutants of concern (metals, nutrients, bacteria), reducing suspended sediment loadings is a priority.

Although some suspended sediment will occur naturally, SSC and sedimentation can be reduced by stabilizing stream banks, reducing and directing storm runoff flow, and improving the riparian conditions or constructing other vegetative filters. Watershed management strategies are being implemented in Arizona to reduce sediment loadings from construction sites, grazing, silviculture, urban development, crop production, mining, recreation (off-highway vehicles), and more.

Metals-related Impairments and Potential Sources

High concentrations of metals, especially dissolved metals, primarily pose a risk to aquatic life because even low concentrations can be toxic to critters that live in the water. Metal pollutants can impair each one of our designated uses if at a high enough concentration.

Arizona has extensive areas of mineralized rock, and therefore, a high potential for metals pollution. Metals leach more readily from soil or mineralized rock that has been exposed by mining or even road building and land development activities. Ore bodies and springs that recharge our streams can also naturally contribute metals to our streams.



Worlds Fair Mine and Stream Below

Acidic conditions occur near mining activities. The lower the pH of the water (more acidic), the more likely metals will be in their more toxic dissolved state. The more neutral or alkaline the water conditions, the more metals adhere to sediment and are less toxic. Fortunately, most of Arizona's lakes and streams are relatively alkaline. When metal-contaminated sediment is transported downstream to a lake, the water slows and the sediments drop to the bottom of the lake, where the contamination becomes buried under layers of sediment. Therefore, most metal exceedances occur near mines and seldom occur in lakes.

Mercury and selenium have a different fate and transport, so they are discussed separately.

Mercury Impairments and Potential Sources

Mercury bioaccumulates in the food chain, with top predator fish having higher mercury concentrations than forage fish. Mercury poses a serious health concern to humans and other animals that prey on fish contaminated with mercury. When the mercury concentration in the edible portion of a fish exceeds 0.3 mg/kg, ADEQ establishes a Fish Consumption Advisory for the lake, in conjunction with the Arizona Department of Health Services and the Arizona Game and Fish Department. These advisories have been issued at a number of lakes in Arizona.

Mercury is naturally present in rock formations in Arizona. If not stabilized, crushed rock mine tailings piles can erode and add mercury and other metals into the surface water. Such abandoned and inactive mine tailings piles are scattered across Arizona. Also, mercury was used in the gold mining process before the introduction of cyanidation technology at the beginning of the 20th Century. In this process mercury was used to amalgamate with the mercury. Then the mercury was evaporated off in a furnace. Some mercury loss occurred in the many steps in this process.

Significant potential point sources of airborne mercury have been shown to be the source of mercury across the United States (*Mercury Study Report to Congress*, EPA, 1997). These sources include coal-fired power plants, waste incinerators, cement and lime kilns, smelters, pulp and paper mills, and chloralkali factories. ADEQ is currently developing a number of mercury TMDLs for lakes and is collecting data to quantify the mercury contribution from atmospheric deposition.

Summary Information

Chapter III - 9

Selenium Impairments and Potential Sources

Selenium bioaccumulates and can cause reproductive effects to fish and waterfowl. Selenium is a naturally occurring metalloid. It has a complex biogeochemistry in the aquatic environment as it can exist in and transform between several oxidation states, each with varying bioavailability and toxicity. It also has a very narrow concentration range between nutritional requirements and toxicity. Therefore, assessing the risk posed by selenium exceeding chronic criteria requires extensive site-specific studies, with the primary focus on documenting reproductive effects to exposed fish and waterfowl.

Anthropogenic sources of selenium in Arizona may include: irrigated agriculture return flows and drainage, combustion of fossil fuels, coal mining, sulphide ore mining (copper, lead, zinc mines) and animal feed supplements.

Pesticide-related Impairments and Potential Sources

The historic use of banned pesticides is still the primary source of pesticide contamination problems in Arizona. Banned pesticides such as DDT take a long time to degrade. Meanwhile, relatively small concentrations can bioaccumulate in the food chain, passing higher concentrations on to offspring and predators, including humans. The presence of pesticides in fish tissue has lead fish consumption advisories being posted for the Gila River, Salt River, and Hassayampa River below the Phoenix Metropolitan area down to Painted Rocks Dam. These pesticides were used on cotton and citrus fields and are transported into our streams and lakes attached to sediments from the historic crop land.

Comparison of Point Source and Nonpoint

Sources of Pollutants — Water pollution is often discussed in terms of "point" and "nonpoint" sources. Thirty years ago, federal and state regulations primarily governed point source discharges through the National Pollution Discharge Elimination System (NPDES) permit requirements. Point sources come from a discrete discharge point or pipe (e.g., a wastewater treatment plant discharge). However, pollution also comes from more diffuse sources that are referred to as "nonpoint sources," such as runoff from urban areas, farm fields, or mining operations.

Differentiating between point and nonpoint sources is not always clear. For example, are septic systems or



Potential for Nonpoint Source Pollution

stormwater runoff from mine tailings, construction sites, urban areas, or concentrated animal feeding operations considered point sources or nonpoint sources? All of these require permits. The stormwater runoff examples require an NPDES general permit. However, reductions in stormwater loadings are handled by application of nonpoint source management practices. For this assessment, these sources were differentiated as follows:

- Septic systems were considered nonpoint sources.
- Stormwater runoff from constructions sites was considered nonpoint sources.
- Stormwater runoff from urban areas was considered nonpoint sources.
- Stormwater runoff from concentrated animal feeding operations was considered a nonpoint source.
- Active mine sites that are required to obtain a general NPDES permit were considered point sources, while inactive or historic mine sites were considered nonpoint sources. For this assessment, only historic mine tailings were considered sources of impairments.

What does? this mean?

ary Information

Chapter III - 10

Estimated Contributions from Point and Nonpoint Sources - 2006

BEAUTY PROCESSING	Point Source	Nonpoint Source
Streams (miles)	46	3,373
Lakes (acres)	520	58,261

^{*}Miles include intermittent and ephemeral streams, canals, and washes.

Most pollution in Arizona's surface waters is contributed by nonpoint or diffuse sources of pollution. This may indicate the effectiveness of the state and federal regulatory programs working with point source discharges. The control of nonpoint source contributions largely remains non-regulatory, based on education and funding of mitigation projects.

CHAPTER IV ACTION PLAN

How do we get from assessments to water quality improvements? This chapter will discuss programs involved in mitigating water pollution problems. It will also discuss water quality research, including research into new standards, monitoring, and assessment techniques.

Impaired Waters → Now What

Monitoring and assessments are part of a process to identify impaired waters and then reduce discharges of pollutants in the watershed. Impaired waters are listed in **Appendix B**, in Categories 4 and 5. Impaired waters that require a Total Maximum Daily Load Analysis (on the 303(d) List) are in Category 5. Impaired waters that do not require a TMDL (at this time) are in Category 4. For example, once the TMDL is completed, the surface water is moved to Category 4A. Surface waters that are impaired solely due to natural conditions are in Category 4N. If actions are being taken so that surface water standards will be met, ADEQ and EPA may agree to place the impaired water in Category 4B. (See the Assessment Methods document for further information).

It is important to recognize that all waters in Category 4 and 5 are "impaired," even waters that are solely impaired due to natural conditions. These waters are protected under Arizona's Antidegradation Rule (Arizona Administrative Code R18-11-107), as a "Tier 1" waters. No further degradation by that pollutant is allowed. Potential pollutant loadings must be considered by ADEQ and several federal agencies before permits or certification are issues (e.g., NPDES/AZPDES discharge permits, grazing permits).

Total Maximum Daily Load Analyses — Usually, if an assessment unit is identified as impaired, a Total Maximum Daily Load (TMDL) must be developed. A TMDL is a written analysis that determines the maximum amount of a pollutant that a surface water can assimilate (the "load"), and still attain water quality standards during all conditions.

Pollutant loading can originate from two types of sources: point and nonpoint. Point sources are discrete conveyances of pollutants discharged directly to a surface water, such as wastewater treatment plant outfalls. Nonpoint sources are non-discrete discharges, including runoff generated by activities such as grazing, agriculture, mining and forestry.

Waste load reductions from point sources can be managed through permitting programs such as Arizona's Pollutant Discharge Elimination System. However, there are few regulatory actions available to control nonpoint pollution, so load reductions from these sources are primarily voluntary. Nionpoint source pollution may include excessive sediment caused by the denudation of grasslands, the location of roads, construction, bacteria from wildlife and/or recreation, metals from historic mining practices and road cuts through ore bodies, and pesticides from historic agricultural practices.

Sources of pollutants are identified in the initial phase of the TMDL. If natural background is the sole source or if monitoring shows that the pollutant contamination no longer exists, the pollutant will be "delisted." If natural background would cause the water quality criterion to be exceeded, ai'though there are other pollutant sources, a site specific standard must be developed before the loadings can be calculated.

TMDL Schedule and Prioritization — A schedule for TMDL development is provided in Appendix C. Criteria for this ranking is established in the Impaired Waters Rule (R18-11-606) (see Assessment Methods document). In general, waters with "high priority" factors are scheduled to be hitiated within two years following EPA's approval of the 303(d) List, as these have a substantial threat to health and safety to humans, aquatic life, or wildlife. However, some "low priority" factors actually take precedence over high priority factors when completing the TMDL at this time would either not be appropriated or an effective

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use of resources (e.g., standard change is proposed).

The published schedule may be revised due to changes in resources to complete TMDLs or new information obtained while developing the TMDL. Such changes are formally negotiated with EPA and would be made known to the public through the TMDL status page on ADEQ's website: www.azdeq.gov. Currently TMDLs have been approved on least 38 assessment units since 1998.

TMDL Implementation Plans (TIPs) – After load allocations are established in the TMDL, strategies must be implemented in the watershed so that these allocations will be met in the future. Normally the TIP is included in the TMDL and it identifies generic strategies, agencies or groups who will be involved in implementation, a tentative schedule, and how effectiveness will be determined. The table in **Appendix F** also indicates the status of TMDL Implementation Plan development.

Landowners, governmental agencies, nonprofit organizations, and other stakeholders are actively encouraged by ADEQ to help develop these management strategies. Implementation of strategies or projects rely on the cooperation of stakeholders that live within the watershed or have management responsibilities for the lands and the surface and ground water resources within the watershed.

To reduce nonpoint source pollution, ADEQ works with federal, state, and local agencies, tribes, nonprofit organizations, the environmental community, and local citizens to develop and implement watershed management strategies. ADEQ's Nonpoint Source Program aims to address water quality issues primarily through public education and involvement – development of a commitment to watershed stewardship.



Implementation on Nutrioso Creek

The Nonpoint Source Control Program relies on this type of cooperation, education and partnership as the primary method to reduce nonpoint source pollution and improve the state-s water quality.

Watershed Partnerships – Watershed protection groups (partnerships) were first organized in Arizona by the Department of Water Resources to address water quantity issues – limited water resources, high water demands, and water rights. ADEQ is now working with these groups, along with groups established during TMDL development, to address water quality issues. Active watershed partnerships and contact information is provided in the watershed discussions in Chapter II.

Water Quality Improvement Grants – These funds (Clean Water Act Section 319(h) Funds) implement on-the-ground water quality improvement projects that address nonpoint sources of pollution. ADEQ administers these grants. Watershed Protection Funds, administered by the Arizona Department of Water Resources, also fund projects that enhance or restore surface waters, associated riparian resources and wildlife habitat. Projects that received these funds since 2000 are described in the watershed reports in Chapter II. Projects designed to reduce loadings of pollutants causing impairment are given highest priority. As documented in the table in Appendix F, even before a TMDL can be developed, funds are often distributed to implement projects that will reduce pollutant loadings!

The Water Quality Improvement Grant Manual provides details about the grant process. A copy of the manual and other information about this program can be obtained by contacting the grant coordinator at (602) 771-4635 or toll free at (800) 234-5677 (extension 771-6535) of from the internet at

Chapter IV - 2 Draft February 2007 Publication Number: EQR 07-02 www.azdeq.gov/environ/water/mgmt/planning. Information about the Arizona Water Protection Fund can be obtained by contacting the commission at (602) 417-2400 extension 7016.

Watershed Based Plans – Watershed plans are needed to properly allocate limited resources in mitigating water quality issues. Several watershed partnerships have developed such plans, identifying critical water quality problems in their areas. A good watershed plan include identify the following elements:

Critical water quality issues,

Probable sources of pollutants,

Strategies to reduce or eliminate such problems - and who would take these actions,

Technical and financial assistance to implement actions,

A schedule (milestones), and

How effectiveness would be measured.

The Nonpoint Source Education for Municipal Officials (NEMO)
Project, funded by EPA, has been working with ADEQ and the local
watershed groups to develop watershed based plans. Their plans go
even further by adding the following elements to these watershed
plans:

Characterize the watershed,

Prioritize sub-watersheds according to risk.

Watershed plans developed by NEMO can be downloaded from their web site at: www.srnr.arizona.edu/nemo.

Master Watershed Steward Program – The mission of the Master Watershed Steward Program is to educate and train citizens across Arizona to serve as volunteers in the protection, restoration, monitoring, and conservation of their water and watersheds. This new program is a partnership of the University of Arizona Cooperative Extension and ADEQ. Classes are being taught across the state.

To become a Master Watershed Steward, participants attend the required 50 hours of course and field work and provide a minimum of 40 hours of volunteer service to their communities and watersheds. Stewards learn about:

- Watersheds and hydrology
- Local geology and soils
- Arizona climate
- Water quality and quantity issues
- Regional, state, and local water management
- Mapping and geospatial technology (GPS)
- Watershed fauna and flora
- How to work together

More information can be obtained from the Arizona Extension Service at their website: cals.arizona.edu/watershedsteward.

Volunteer Monitoring – Volunteer monitoring groups can monitor the condition of surface and ground water. Gateway Community College in Phoenix, in cooperation with ADEQ, has developed a one-credit course on water quality sampling to train Arizona's volunteers and provide further opportunities for watershed stewards. Information about these classes can be obtained at the college website: environment.gatewaycc.edu/resources/volunteermonitoring/default.htm.

Determining Water Quality Improvements – Once a TMDL has been developed, the surface water is removed from the 303(d) list, but usually the water is still impaired and simply moves from the Category 5 to the Category 4 list of impaired waters. To determine that a water is no longer impaired by a pollutant,

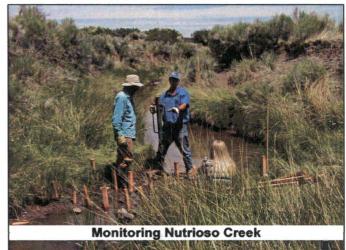


Publication Number: EQR 07-02

ADEQ must do further monitoring. These new samples need to be collected during critical conditions – those environmental factors (stream flow, season, runoff events, location, runoff events) during which an exceedances of a water quality standard or criterion is most likely based on past exceedances or

modeling results. There may also be critical locations or sites where exceedances are most likely to occur. Critical conditions and locations are identified in **Appendix E**. This list is constantly being revised as new information is analyzed.

The number of samples required to establish that a surface water is no long impaired varies by type of pollutant, but the factors are specified in the Impaired Water Identification Rule (see Assessment Methods document (draft 2006). The delisting criteria vary depending on the criteria used during the listing.



This assessment showed that a number of pollutants could be removed from the impairment tables. A list of pollutants no longer impairing waters and waters that are no longer impaired is provided in **Appendix D**.

Potential Impacts on Permitted Discharges — Although assessments are <u>not</u> compliance based actions, once an assessment unit is identified as impaired, there are indirect consequences on dischargers or potential activities in the drainage area. For example, any entity seeking a permit for a new discharge or renewing an existing permitted discharge under the National (or Arizona) Pollutant Discharge Elimination System (NPDES/AZPDES) Program must demonstrate that it will not increase loadings for the parameter identified as causing the impairment. During the permit review cycle, additional monitoring may be required for the pollutant of concern. If discharge monitoring data or ambient in-stream monitoring data is available from a permitted facility, it may be used to model the discharge load during the TMDL. Such data can be used to accurately quantify the contribution from waste loads. After the TMDL is completed, ADEQ may renegotiate the permit discharge levels if the TMDL indicates that a waste load reduction is necessary. Discharge monitoring and ambient in-stream monitoring is invaluable in developing realistic discharge limitations.

Another example is that federally approved actions, such as grazing permits, may also be restricted when a stream is listed as impaired, if those actions would contribute pollutant loadings. ADEQ actively coordinates with the U.S. Forest Service and the Bureau of Land Management to identify strategies that would minimize load reductions especially to impaired waters.

Future Assessments and Monitoring

Assessments are based on standards and standards are based on scientific studies. New monitoring and assessment methods being developed are based primarily on regional studies. Arizona has taken the forefront in developing physical integrity and bioassessment methods appropriate for an arid region. Current monitoring and assessment methods are discussed in detail in the Assessment Methods document (draft 2006).

The following table indicates the existing basis of water quality assessments and the assessment tools being developed. Several rule revisions are being proposed during the current Triennial Review that will provide new tools for assessments.

Future Basis of Assessments

	AQUATIC	UATIC HUMAN HEALTH			
	AND WILDLIFE	Body Contact	Fish Consumption	Water Source	Agriculture
BIOLOGICAL					
Escherichia coli (bacteria)		Existing			
Narrative nutrients (chlorophyll-a, algae, phytoplankton in lakes)	Proposed standards	Proposed standards	Proposed standards	Proposed standards	
Macroinvertebrate community	Proposed standards				
PHYSICAL/HABITAT					
Narrative bottom deposits	Proposed standards				
Suspended sediment concentration	Existing and Proposed revisions				
Stream channel stability	Developing standards				
CHEMICAL					
Water column chemicals (nutrients, metals, pesticides, VOCs, radiochemicals, etc)	Existing	Existing	Existing	Existing	Existing
Tissue samples			Developing standards		
Physical chemicals (pH, dissolved oxygen, temperature)	Existing	Existing	Existing	Existing	Existing
Narrative nutrients	Proposed	Proposed		Proposed	
(DO, pH, ammonia in Lakes)	standards	standards		standards	
Narrative toxicity	Developing implementation procedures	Developing implementation procedures	Developing implementation procedures	Developing implementation procedures	
Contaminated sediment	Need to develop standards	Need to develop standards	Need to develop standards	Need to develop standards	Need to develop

Probability-based Monitoring in Streams – In 2006, ADEQ began using Regional Environmental Monitoring and Assessment Program (REMAP) methods developed by EPA to determine the status and regional-scale trends in water quality in streams. These methods use statistical-based site selection and an array of analytical tests and field measurements to estimate the current status, extent, changes, and trends in water quality on a regional basis. Using this method, sites would be selected randomly, so inferences can be made concerning regional water quality based on samples collected.

The following types of analytical tests and field measurements are used at each site to provide a broad assessment of condition and stressors:

• Water chemistry - To identify stressors (e.g., nutrient enrichment, metals) and classify water type

- Physical habitat Degradation of riparian condition, channel stability, or stream bank stability acts to reduce the complexity and abundance of aquatic habitat and aquatic species.
- Benthic macroinvertebrate assemblage Macroinvertebrates in streams reflect overall biological integrity. They also respond differently to stressors, so it may be possible to determine the type of pollutant causing the stress.

Where appropriate, fish tissue contaminants may also be collected to measure bioaccumulation of toxic chemicals in fish and indicates regional risks to humans and wildlife.

Biocriteria Development - ADEQ has developed methods for assessing the biological integrity of perennial, wadeable streams in Arizona. Regional reference conditions were established and used to develop macroinvertebrate indexes of biological integrity.

Index of Biological Integrity

Biological integrity is the capability of maintaining a balanced, integrated, adaptive community of organisms. This community has a species composition, diversity, and functional organization comparable to that of the natural or least impacted habitat of the region. This least impacted diversity becomes the "reference conditions" used to measure and assess water quality.

The biological integrity of a stream reach can be determined by comparing its community characteristics to those of the reference community. Currently warmwater and coldwater community indexes have been established for perennial, wadeable streams.

The following reports have been produced by the Biocriteria Program and can be obtained by contacting ADEQ at (602) 207-4543 or on-line at the ADEQ website at www.azdeq.gov/environ/water/assessment/bio.html:

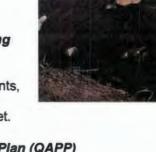
Using Ecoregions for Explaining Macroinvertebrate Community Distribution Among Reference Stream Sites In Arizona

Patrice Spindler, ADEQ (1996) This study provides a classification system for warmwater and coldwater communities based on elevation to differentiate among aquatic communities in Arizona.

Macroinvertebrate Community Distribution Among Reference Sites In Arizona

Patrice Spindler, ADEQ (2001)

A "regional reference site" approach to bioassessments. based on warmwater communities below 5000 foot elevation and coldwater communities above 5000 feet.



Biocriteria Program Quality Assurance Program Plan (QAPP)

Patrice Spindler, ADEQ (2006, in-press)

Documents the bioassessment methods and protocols ADEQ is following. These methods need to be used when collecting samples in order to use the macroinvertebrate Index of Biological Integrity. Methods for measuring physical-habitat to support bioassessments are also included in this document.

- Development and Testing of a Biological Index for Warmwater Streams in Arizona
 Gerritsen and Leppo, Tetra Tech Inc. (1998)
 This provides the statistical support for Arizona's warmwater macroinvertebrate Index of
 Biological Integrity -- perennial, wadeable streams below 5000 feet elevation.
- Development and Testing for Biological Index for coldwater Streams in Arizona
 Leppo and Gerritsen, Tetra Tech, Inc. (2000)
 This provides the statistical support for Arizona's coldwater macroinvertebrate Index of Biological
 Integrity perennial, wadeable streams above 5000 feet elevation.
- Stream Channel Morphology and Benthic Macroinvertebrate Community Associations in the San Pedro River and Verde River basins of Arizona, 1999-2002
 P. Spindler (2004)

This study evaluated relationships between stream channel geomorphology measurements and the metrics that describe the macroinvertebrate community. The study found that the macroinvertebrate community responded to particle size changes and embeddedness of the substrate, with loss of taxa or shifts to more tolerant taxa at low levels of fines in the Verde and moderately high levels in the San Pedro River basin. Macroinvertebrate communities respond to sedimentation but the sensitivity may be different between hydro-physiographic provinces across Arizona.

 Narrative Biocriteria Standard Implementation Procedures for Wadeable, Perennial Streams

Patrice Spindler and Steve Pawlowski, ADEQ (Draft 2006)

Documents ADEQ's approach to determining an exceedance of the narrative biocriteria standard for wadeable, perennial streams based on a warmwater and coldwater Indexes of Biological Integrity. ADEQ will use the 25th percentile of reference condition as the minimum threshold needed to attain the biocriteria standard. A verification sample will be required when the Index score falls between the 10th and 25th percentiles of reference conditions.

 Index of Biological integrity Technical Support Documentation for the Narrative Biocriteria Standard

Patrice Spindler, ADEQ (Draft 2006)

This document provides a detailed rationale for development and selection of metrics and thresholds for the Indexes of Biological Integrity.

Physical Integrity Criteria Development --

The physical integrity of a stream channel means that a dynamic equilibrium in stream channel stability is maintained over time. Rosgen (1996) provides a good definition of dynamic stability which can be defined as the ability of a stream to carry the water and sediment of its watershed while maintaining a stable dimension, pattern, and profile such that, over time, stream channel features are maintained and the stream system neither aggrades nor degrades. Dave Rosgen has developed a system for classifying streams into one of seven stream types and assessing stream channel stability, including bank stability. ADEQ is testing and calibrating Rosgen's channel stability assessment methods for use in evaluating physical integrity conditions in Arizona streams.

These classification and assessment methods are



Bed Load Monitoring

being applied and tested in Arizona's streams and have lead to the following publications:

• Regional Relationships for Bankfull Stage in Natural Channels for Central and Southern Arizona

Moody and Odem (1999)

Sites on perennial, intermittent, and ephemeral streams in central and southern Arizona were chosen to determine regional relationships of bankfull stage in natural channels. Watershed area and channel characteristics (width, depth, cross-section) were used to create "regional curves." These regional curves can then be used to identify bankfull in any other natural channel. Bankfull determinations are necessary for classifying streams according to Rosgen (1996).

 Integrating Regional Relationships for Bankfull Stage in Natural Channels of Arizona and New Mexico

Moody, Wirtanen, Knight, and Odem, Northern Arizona University (2000)
This report integrates data from 139 study sites in Arizona and New Mexico to create regional curves for shared surface water drainages and ecoregions. These curves are the broad-scale regional curves that are currently used by ADEQ monitoring programs.

 Validating the Bank Erodibility Hazard Index in Central and Southern Arizona Moody, Wirtanen, and Yard (2003)

The purpose of this research document was to test and calibrate Rosgen's "Bank erodibility hazard index (BEHI)" for use in Arizona. This tool is an integral part of the Rosgen stream stability assessment method. The analysis found that the BEHI model produced reasonably accurate predictions of annual bank erosion when compared with measured erosion rates at more than 40 sites in the San Pedro and Verde River basins.

 Channel Stability Assessment of Biocriteria Sites in the Verde River Watershed Moody, Wirtanen, and Yard (2003)

This analysis documents the first application of the complete Rosgen stream channel stability assessment methodology to streams in Arizona. It provides physical integrity assessments for 10 sites in the Verde River Basin and recommendations for further research in calibrating the Rosgen method for Arizona.

Lower Clenega Creek Restoration Evaluation Project: an Investigation into Developing
 Quantitative Methods for Assessing Stream Channel Physical Condition
 Lin Lawson and Hans Huth, ADEQ (2003)

This research effort evaluated a 10-mile reach of the Lower Cienega Creek basin for potential stream stabilization projects and developed quantitative techniques for assessing physical stream channel condition. Quantitative techniques used to evaluate sedimentation included the "Linear habitat complexity index" and "pool facet slope".

• Comparative Sediment Rating Curves for Two Gage Stations In the Upper Salt River Basin of Arizona

Patrice Spindler, ADEQ (2005), Wetlands VIII Grant from EPA

This research effort evaluated whether sediment rating curves could be used to compare "reference" and study sites to set sediment load reduction targets in sediment impaired streams. However, during the study period, the flows for Beaver Creek (the impaired stream) were only 40% of flows in West Fork of Black River (reference stream), so less sediment transport occurred in Beaver Creek due to low flow. The study showed that sediment loads can be accurately and comprehensively estimated using remote automatic sampling of turbidity and flow data at gaging stations.

Draft Fluvial Geomorphology Field Survey and Assessment Procedures
 ADEQ (2004)

Field methods for conducting stream surveys and Rosgen stability assessments are provided in

this draft document.

 A Manual of Procedures for the Sampling of Surface Waters in Arizona Lin Lawson (2005)

Currently used field procedures for conducting water quality, biological and physical integrity/geomorphology/Rosgen surveys are provided in this new methods document.

• Narrative Bottom Deposits Standard Implementation Procedures

Patrice Spindler and Steve Pawlowski, ADEQ (Draft 2006)
This paper documents ADEQ's approach to determine compliance with the narrative bottom deposits surface water quality standard in Arizona Administrative Code R18-11-108(A)(1).
Exceedances will be determined based on the percentage of fine sediments (<2mnn) in riffle / run habitats in perennial streams using a Wolman pebble count procedure. An exceedance occurs when the percentage of fines in riffle habitats is >35%. An exceedance also occurs if the percentage of fines in the riffle habitats is between 20% and 35%, and a bioassessment index

Analysis of Water Quality Functions of Riparian Vegetation

Facing Colors (4004)

score indicates impairment of a biological community.

Engineering Science (1994)

This is a technical review of existing scientific knowledge on the functional roles of riparian vegetation in controlling surface water quality and characteristics of the riparian cr wetland type that enables it to perform each function.

• A Guidance Document for Monitoring and Assessing the Physical Integrity of Arizona's Streams

Graf and C. Randall (1998)

Basic scientific principles for understanding and describing physical integrity in terms of indicator measurements: channel width, cannel depth, channel gradient, hydraulic roughness, flow velocity, water discharge, sediment discharge, sediment particle size, channel sinuosity, channel pattern, shear stress, stream power, and bankfull conditions.

Narrative Nutrient Implementation Procedures Development – In response to EPA's National Nutrient Strategy, ADEQ is revising nutrient standards. It is starting with nutrients for lakes and reservoirs, as these waters are more likely to be impaired by nutrients than streams. ADEQ also needed to develop clear implementation procedures to apply the narrative nutrient standard in Arizona Administrative Code R18-11-108(A)(7).

To derive and implement nutrient criteria, lakes were separated into categories based on natural or inherent characteristics that cause lakes to respond to nutrients in a similar manner, and secondly, based on similar management objectives and public expectations. The following lake categories will be used in conjunction with lake nutrient standards:

- Deep lakes and reservoirs Average depth over 18 feet.
 - These deep reservoirs have low nutrient and chlorophyll-a concentrations and higher Secchi depths (clarity), probably due to relatively high flushing rates, deep settling of nutrients, and sedimentation in upstream reservoirs.



Roosevelt Lake

- Shallow lakes Average depth less than three meters, maximum depth of four meters.
 - These lakes are susceptible to macrophyte domination because much of the lake bottom is in the photic zone (light available). Such lakes can have relatively high Secchi depths and low-moderate chlorophyll-a concentrations.
- Urban lakes Lakes in urban settings.
 - Urban lakes have different management objectives than other lakes. For example, they
 are not used or water supply or for swimming. They may have high sediment and nutrient
 loads from urban land uses that are impractical to control completely. Urban lakes
 generally have relatively poor clarity, and high chlorophyll-a and nutrient concentrations.
- Igneous and sedimentary lakes The remaining lakes
 - These lakes are managed primarily for fishing and other recreational purposes. Data indicates that igneous watersheds are more likely to experience high chlorophyll-a and nitrogen concentrations than sedimentary lakes.

Work on developing nutrient standards has lead to the following publications:

- Draft Potential Nutrient Related Targets for Lakes and Reservoirs In Arizona
 Malcolm Pirnie, Inc for ADEQ (2005)
 Derivation of numeric nutrient water quality targets to assess lakes. Uncertainty and variability in relations between nutrients, response variables, and designated uses was addressed by expressing the nutrient targets as a range. These nutrient targets are to be incorporated into the narrative nutrient implementation guidance document.
- Statistical Modeling Analysis Report of Lakes and Reservoirs
 Malcolm Pirnie, Inc for ADEQ (2004)
 This report provides the statistical basis for the narrative nutrient matrix and the lakes classification. Results can be used to determine realistic and appropriate water quality targets for different lake categories.
- Narrative Nutrient Standard Implementation Procedures for Lakes and Reservoirs
 Susan Fitch, ADEQ (2006)
 This paper documents ADEQ's approach to determining and exceedance of the narrative nutrient standard in Arizona Administrative Code R18-11-108(A)(7). An exceedance is determined based on a matrix of threshold values for: chlorophyll-a, Secchi depth, blue-green algae, phosphorus, nitrogen, dissolved oxygen, and pH. In most cases, supporting evidence is needed to determine an exceedance.
- An Exploration of Nutrient and Community Variables in Effluent Dependent Streams in Arizona
 David Walker (University of Arizona), Christine Goforth (University of Arizona), and Samuel Rector (ADEQ). EPA Grant Number X-828014-01-01 (2006)
 Samples were collected from five effluent dependent waters (EDWs) in 2003 2004. Each site was sampled once during the summer and winter, as close to the respective effluent outfalls as possible, and at some distance downstream. The downstream site was determined by attempting to find a recovery zone where dissolved oxygen increased to "normal" levels, although a recovery zone was not found in some of these EDWs.

Diversity and pollution tolerance of aquatic macroinvertebrate assemblages are inversely related to increasing levels of pollutant loading to the receiving stream. Elevated concentration of reduced and organic forms of nitrogen, combined with low levels of dissolved oxygen, were of particular detriment to macroinvertebrates.

Other Studies and Projects

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A Manual of Conservation Practices to reduce Pollution Loads Generated from Nonpoint Sources

Tetra Tech, Inc and Natural Channel Design, Inc (2004)

The implementation appendix is a manual designed to assist landowners, managers, and technicians in adopting effective and appropriate practices to reduce nonpoint source pollutants entering streams and watercourses. In general practices described are meant to be implanted in areas immediately adjacent to the surface water; however, some treatments can be utilized effectively in uplands and other areas.

Assessment of Selected Inorganic Constituents in Streams in the Central Arizona Basins Study Area, Arizona and Northern Mexico, through 1998

David W. Anning, U.S. Geological Survey, Water-Resources Investigations Report 03-4063 (2003)

Stream properties and water chemistry constituent concentrations were analyzed to assess water quality, determine natural and human factors affecting water quality, and compute stream loads in the Central Arizona Basins study area. Data was collected at 41 sites through 1998.

• Use of Sediment Coring to Analyze Past Response to Disturbance

David Walker and Owen Davis - University of Arizona and Paul Gremillion - Northern Arizona University (Start project in 2006)

To collect core samples from Roosevelt Lake to quantify long-term water quality trends in Roosevelt Reservoir and the Salt River watershed. The project will also determine how these watershed variables define water quality within the reservoir and how aquatic biota respond to these water quality changes.

Algal Toxins in the Salt River Reservoirs

David Walker – University of Arizona, Paul Zimba – USDA, and Jo Ann Burkholder – North Carolina State University. (Start project in 2006)

Monitoring of algal and cyano-toxins in all of the Salt River Reservoirs (Roosevelt, Saguaro, Canyon, and Apache lakes) is to be expanded into a study of environmental factors needed to encourage toxin production in algae.

• Effects of Endocrine Disrupting Compounds and Pharmaceuticals on Fish

David Walker (ag.arizona.edu/limnology/0306report.pdf)

Examining the effect of endocrine disrupting compounds and pharmaceuticals left in treated wastewater effluent on relatively pollution-tolerant fish (bonytail chub) has shown that sever detrimental impacts on the population is likely due to significantly lowered 17B-estradiol levels in female fish. The study also found feminization of male fish. Very low concentrations of typical wastewater compounds were present (e.g., nutrients) in the treated effluent. Results are to be presented at the National Groundwater Associations 5th International Conference on Pharmaceuticals and Endocrine Disrupting Chemicals in water on March 13, 2006.

Draft Guidance for Implementing January 2001 Methylmercury Water Quality Criterion EPA (August 2006)

This document describes methods for measuring mercury and methylmercury in both tissue and water samples. This document describes how to interpret the data collected and assess designated use support.

Monitoring Mercury Deposition

Jennifer Hickman - ADEQ

Arizona's first Mercury Deposition Network (MDN) site is being established along Sycamore Canyon, in the Raymond Boy Scout Camp near Parks, Arizona to help quantify mercury deposition. This data will be used in the development of mercury TMDLs. More information can be obtained by contacting Jennifer Hickman at: (602) 771-4542.

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 Implementation Guidance for Ambient Water Quality Criteria for Bacteria U.S. EPA (November 2003 Draft)

This document provides recommendations on the implementation of bacteria criteria for the protection of recreation uses. It provides explanations of how to assess and determine attainment of water quality standards, develop subsequent TMDL loads/wasteload allocations, and how recreational water quality criteria should be used in NPDES permits.

 Organochlorine Compounds in Streambed Sediment and in Biological Tissue from Streams and Their Relations to Land Use, Central Arizona

J.B. Gebler – National Water Quality Assessment Program, U.S. Geological Survey
The objective of the study was to determine the occurrence and distribution of organochlorine
compounds (pesticides) and their relation to land use in central Arizona. Sediment samples were
collected at 13 sites, and biological tissue samples at 11 sites. The greatest number of
compounds and highest concentrations of many contaminants were detected at agriculture/urban
sites. The compound detected most frequently in sediment and tissue samples was p,p'-DDE (a
DDT metabolite).

Selenium – Fate and Effects in the Aquatic Environment

Peter M. Chapman, EVS Environment Consultants
Proceedings of the 24th Annual British Columbia Mine Reclamation Sympos

Proceedings of the 24th Annual British Columbia Mine Reclamation Symposium – The Technical Research Committee on Reclamation (2000)

Series of studies by the Arid West Water Quality Research Project

Pima County Wastewater Management, www.pima.gov/wwm/wqrp (2004)

- Extant Criteria Evaluation Objective to examine the appropriateness of Arizona's Water Quality Criteria for western ecosystems, identify weaknesses, and recommend further research to address weaknesses.
- Discharge Survey Gather information to identify the nature of existing arid west surface waters receiving wastewater discharges, and species or habitats that are affected by discharges to these waters.
- Evaluation of the Reliability of the Biotic Ligand Model Predictions for Copper Toxicity in Waters Characteristic of the Arid West – A series of studies to evaluate the appropriateness of the Biotic Ligand Model to determine copper toxicity in Arizona's hard water.
- Habitat Characterization Study Documents the physical, chemical, and biological characteristics of 10 effluent dependent waters in the arid west.

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Evaluation of Whole Effluent Toxicity Testing as an Indicator of Aquatic Health – This
pilot study was designed to determine: 1) Which biological assemblages should be
sampled to assess effluent impacts, 2) What are the appropriate sampling methods for
macroinvertebrates and should the methods vary with the type of hydrological setting, 3)
Are the proposed data and measurement quality objectives achievable on a regular
basis.

Progress and Accomplishments

Are these actions working? Are we progressing or even holding our own if we continue to identify impaired waters? Can we measure effectiveness or success?

The Association of State and Interstate Water Pollution Control Administration (ASIWPCA) is asking each of the states to look for indications of progress since the 2002 listing cycle. Most of the following performance measures were chosen ASIWPCA to evaluate national progress, but can also provide some indication of how well Arizona's monitoring and assessment programs are working.

Evaluating Progress in Monitoring and Assessment Programs – Changes in the amount of surface waters assessed is one way to evaluate ADEQ's Assessment and Monitoring Programs. The following tables show the stream miles and lake acres assessed in 2002, 2004, and 2006.

These tables exclude the surface waters assessed in Category 3 (all uses "inconclusive") because by default any water not assessed would belong in this category. The assessment shows some surface waters in this category – those with any current assessment information – but no attempt is made to include all of the other waters that belong in this category, as many are unnamed washes.

Total Waters Assessed

	LAKES				STREAMS	
	2002	2004	2006	2002	2004	2006
	Acres				Miles	
Estimated Waters	289,630	289,630	295,590*	90,375	90,375	90,375
Waters Assessed*	40,948	67,340	88,663	1,671	2,227	2,801
Percent Assessed	14%	23%	30%	2%	2.5%	3%

^{*}Waters Assessed excludes Category 3 - all uses assessed as "inconclusive"

The Total Waters Assessed table (above) indicates that a very low percentage of the state's surface waters are assessed. This is primarily because the majority of waters in Arizona are ephemeral (flowing in response only to precipitation events) and not easily sampled or assessed. The Total Perennial Waters Assessed table (below) adjusts for this. Monitoring is clearly focused on perennial waters (waters that flow year round). Monitoring ephemeral and intermittent waters is limited to special investigations, such as TMDL development.

Total Perennial Waters Assessed

	LAKES			STREAMS			
	2002	2004	2006	2002	2004	2006	
		Acres			Miles		
Estimated Perennial Waters in Arizona	168,590	168,590	174.558*	3,530	3,530	3,530	
Perennial Waters Assessed*	39,873	66,264	87,773	1,405	2,081	2,685	
Percent Assessed	24%	39%	50%	40%	59%	76%	

^{*} Perennial Waters Assessed excludes Category 3 - all uses assessed as "inconclusive"

As shown in the Perennial Waters Assessed table (above), a steady increase in the percent of perennial surface waters has been occurring. Also, by comparing the total waters assessed (first table) with the total perennial waters (second table), one can see that the number of miles assessed as "inconclusive" has decreased.

Another way to look at the effort and effectiveness of these programs is to look at the number of lakes and stream reaches assessed. This is particularly revealing with lakes, as their sizes vary from less than an acre to 27,045 acres. Therefore, monitoring and assessing 20 small, but significant lakes might account for fewer acres than one large

^{*}Estimated lake water size increased due to enlargement of reservoirs.

^{*}Estimated lake water size increased due to enlargement of reservoirs.

Assessment Units Assessed

		LAKES			STREAMS	
	2002	2004	2006	2002	2004	2006
	Lake Assessment Units			Strea	am Assessment	Units
Waters Assessed	40,948 acres	67,340 acres	88,663 acres	1,671 Miles	2,227 Miles	2,801 Miles
Assessment Units	30 units	51 units	79 units	137 units	172 units	298 units

(Excluding Category 3 - all uses assessed as "inconclusive")

The Assessment Units Assessed table (above) reveals that the number of lakes and stream reaches being successfully assessed as either "attaining" or "impaired" and been increasing steadily.

Although we could also look at changes in the number waters assessed as impaired, how should such statistics be judged? Does a decrease in impaired surface waters indicate that water quality is improving, or simply that there has been a change in assessment criteria or standards? Is listing additional waters as impaired success or failure? If the goal is to find more waters are attaining their uses, then monitoring can be targeted in more pristine waters, but does that fulfill ADEQ's goal to improve and protect water quality and natural resources? Due to these issues, ADEQ does not evaluate its Assessment, Monitoring, or even TMDL Program by the number of surface waters assessed as "impaired" or even "attaining."

Delisting Pollutants and Water Quality Improvements – The primary goal of ADEQ's water quality programs is to improve and maintain water quality in Arizona. One way to measure whether ADEQ is achieving its goal to improving water quality is look at the number of stream miles or acres "no longer impaired" (delisted). (Delistings during this cycle are shown in **Appendix E**.)

For this analysis, pollutant impairments are counted rather than the miles or acres. "Pollutant impairments" are the number of pollutants listed multiplied by the number of assessment units listed. For example, if arsenic, cadmium, chromium, copper, zinc, and pH (5 pollutants) were listed for 3 reaches of Pretty River, it would be counted as fifteen "pollutant impairments." The following table shows the number of pollutant impairments removed, using the 1989 list as the baseline for this evaluation.

Pollutants No Longer Impairing Surface Waters

		2002 ASSESSMENT	2004 ASSESSMENT	2006 ASSESSMENT
TOTAL POLLUTANT IMPAIRMENTS		260	195	230
	NEW STANDARD	-	15	-
	NEW ASSESSMENT CRITERIA	81	_	-
DEACONG FOR	WATERSHED IMPROVEMENTS	22 (Gila, Munds, Pinal)	4 (Mineral, Tempe)	1 (Nutrioso)
REASONS FOR DELISTING	NEW DATA, NO WATERSHED IMPROVEMENTS	12	4	9
	NATURAL CONDITIONS	8	-	-
	OTHER	2		-
TOTAL DELISTED		125	23	10

The delistings in 2002 were primarily due to changes in assessment criteria that occurred when the Impaired Waters Rule and TMDL Statute were adopted. The 2004 assessment reflected new surface water quality standards (e.g. replacing the turbidity standard with a standard for suspended sediment concentration). In the current assessment (2006), delistings were primarily the result of new monitoring data showing that the standards are now being met. In only one case improvements in the watershed were demonstrated. The other delistings may be associated with intermittent pollutant loadings and

Chapter IV - 14 Draft February 2007 Publication Number: EQR 07-02 drought conditions reducing pollutant loadings. Improved water quality monitoring and analysis techniques also lead to delisting at least one reach.

Over the past 3 assessments, water quality improvements have been clearly documented in only a few areas:

- Lake Havasu Bacteria contamination at beaches in Thompson Bay were significantly reduced by implementation of strategies to increase stream flow in this back bay area, increase sanitary facilities available at the beaches, and decrease nutrient loadings from wastewater facilities (1 pollutant impairment).
- Middle Gila Pesticide Contamination Area Dieldrin concentration in fish tissue samples dropped below detection limits after a ban on its general use for many years in Arizona. The fish consumption advisory remains in place due to DDT, toxaphene, and chlordane contamination of fish and other edible aquatic life in this area (12 pollutant impairments).
- Mineral Creek Surface water contamination has been mitigated by extensive surface water remediation actions at mining operations along this creek (3 pollutant impairments).
- Munds Creek Improvements in effluent reuse practices resulted in *E coli* bacteria, nitrogen, and phosphorus reductions (3 pollutant impairments).
- Pinal Creek Extensive groundwater and surface water remediation and treatment near mining operations has resulted in significant water quality improvements (6 pollutant impairments).
- Nutrioso Creek Grazing practices have been improved along one reach resulting in reduced sediment loading to the stream (1 pollutant impairment).
- Tempe Town Lake A lake management plan was successfully implemented to control algal growth (that resulted in high pH) in this constructed lake (1 pollutant impairment).

Why so few document water quality improvements? Many reasons contribute to this being a slow process, such as: most improvements require voluntary actions, the high costs to implement many actions, vast size of drainage areas containing large numbers of individual sources, and source contributions from other states, Mexico, and occasionally tribal lands. Even when actions are applied within a watershed, it may take years to see reductions in erosion. Recognizing the difficulties faced, these few documented improvements can be celebrated!

Progress in Completing and Implementing TMDLs – The number of TMDLs and implementation plans (TIPs) completed is another measure of how far we have progressed in the process of remediating water quality problems.

TMDL Progress - By Pollutant Impairments

	rogrood		Assessme			
	1990- 2002	2002	2002-2004	2004	2004-2006	2006
TMDLs Scheduled	The second state of the second	175		131	100	168
TMDLs Approved	63		83		18	
TMDL Implementation Plans Completed	63		83		18	
TIP Strategies Being Implemented	62		53		15	
Alternative to TMDL – Management Plan		1		0		1

Clearly progress is occurring in developing TMDLs and their implementation plans. However, the number of TMDLs dropped during the past two years for several reasons. The Department is taking on more complex TMDLs. State budget constraints lead to staff turnover and delays in replacing staff. Drought conditions have slowed sample collection on ephemeral and intermittent streams. What this table does not indicate is that the Department is in the later stages of several complex TMDLs, such as: Lake Mary regional mercury TMDL, Alamo Lake regional mercury TMDL, Oak Creek Phase II bacteria TMDL, Pinto Creek Phase II copper TMDL, Mule Gulch copper TMDL.

Bill Williams Watershed Water Quality Assessments

Watershed Description

The Santa Maria River and the Big Sandy River drainages merge at Alamo Lake to create the Bill Williams River, which connects to the Colorado River at Parker Dam. Land ownership is divided approximately as 45% federal, 28% state, and 27% private (no Tribal lands). With only 8,000 people (2000 census), this watershed does not have any large population centers. Open range grazing is the principal land use. A large mining complex is located in the Bagdad area, while historic mine sites are scattered throughout the watershed.

Elevations range from 8,417 feet (above sea level) at Hualupai Peak to 1,000 feet near the Colorado River. Most of the watershed is below 5,000 feet, with low desert fauna and flora (Sonoran Desert - Mohave Desert transition area) and warmwater aquatic communities where perennial waters exist.

Water Resources

There is little precipitation, from 13 inches a year, with an additional inch of snowfall per year in higher elevations, so surface water resources are sparse. Perennial flow in this watershed is frequently interrupted (short segments), even on the larger main-stem rivers. The largest lake, Alamo Lake, covers 11,950 acres; however, only an estimated 1,415 acres are perennial.

An estimate of surface water resources in the Bill Williams Watershed is provided in the following table, based on USGS digitized hydrology at 1:100,000, rounded to the nearest 5 miles or 5 acres.

Estimated Surface Water Resources in the Bill Williams Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	185	655	5035
	Perennial	Non-perennial	
Lake acres	1832	11,950	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters.

Watershed Partnerships

The following watershed groups are active in this watershed:

westwindsinc@yahoo.com, or Troy Suter at (928) 442-3885.

- Upper Bill Williams
 The watershed area of concern is approximately defined by Kirkland Creek's drainage area, a tributary to the Santa Maria River. The partnership's mission is to manage and protect water resources water quality and water rights and they advocate local control over water resources and land use. For information, contact Sondra Wilkening (secretary) at (928) 925-6434 or
- Northwest Arizona Watershed Council
 Their area is defined by three groundwater basins: Hualapai Valley (in the Colorado-Grand Canyon Watershed), Sacramento Basin (in the Colorado-Lower Gila Watershed), and Big Sandy (in the Bill Williams Basin). The council's goal is to protect and preserve water resources and educate the public about water issues related to growth and development. The council meets on the 3rd Wednesday of the month in Kingman, AZ. For information, contact Elmo Roundy (928) 757-2818 or Earl Engelhardt at (928) 692-1068 or imspirit@kingmanaz.net.

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Map of watershed showing:

Generalized topography Highways Cities National Forests, Monuments, Refuges Indian lands ??

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses - The following TMDL analyses have been completed, are ongoing, or are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL, if completed, can be obtained at ADEQ's website: www.azdeg.gov.

- Boulder Creek, from Wilder Creek to Copper Creek, near Bagdad, is impaired due to arsenic, beryllium, copper, manganese, mercury, zinc and low pH. Arsenic, copper, and zinc TMDLs were approved in 2004 for arsenic, copper, and zinc, and identified three tailings piles from the former Hillside Mine and a seep (spring) from a collapsed adit as the main contributing sources. A TMDL Implementation Plan was adopted in 2005 and identified encapsulation, grading, and capping of the tailings piles as the primary strategies to reduce loading. A Water Quality Improvement Grant will be used to implement these actions.
- Mercury contamination is impairing Alamo Lake, two reaches of Boulder Creek, and two reaches of the Santa Maria River. Fish consumption advisories have been issued at Alamo Lake and Coors Lake, which caution the public to limit the amount of fish they consume. Mercury may also pose a threat to bald eagles (a federally listed Threatened species) living near the lake, as they also eat the fish. A mercury TMDL and implementation plan is expected to be completed in 2006 for Alamo Lake that will address loadings from these tributaries. Primary sources of the mercury appear to be atmospheric deposition and sediment transport during storm events.
- Alamo Lake and a segment of the Bill Williams below Alamo Lake near Bagdad are also impaired by ammonia and high pH. Ammonia and pH exceedances may be related to nutrient loadings. More monitoring is needed to determine if this is occurring at Alamo Lake and sources of nutrient loadings. A nutrient TMDL is scheduled to be initiated in 2008.

Water Quality Improvement Grant Projects - ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

- Cane Springs Ranch Catchment Restoration Project Cane Springs Ranch (2000) Repair and clean sediment catchments, to lessen sediment loading from Cane Springs Ranch to the Big Sandy River.
- The Greater Kingman Wildcat Dump Cleanup Project NW AZ Watershed Council (2000) Clean up of 18 wildcat waste dump sites in the Kingman area; to reduce potential ground water contamination. Provide education and outreach to minimize further dumping.

Water Protection Fund Projects – The following Water Protection Fund Projects were awarded by the Arizona Department of Water Resources. More information about these funds or projects can be obtained from the ADWR web site at: http://www.azwater.gov.

- Big Sandy River Riparian Project U.S. Bureau of Land Management (2000) Restore riparian condition along an 8-mile perennial reach of the Big Sandy River to reduce sediment transport. This included pasture fencing and development of alternative water sources for livestock.
- Kirkland Creek Watershed Resource Assessment Project Triangle Natural Resources Conservation District (2000) Complete a resource assessment of Kirkland Creek and prepare a long-term action plan and implementation schedule for watershed enhancement activities.

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Other Water Quality Studies - The following additional water quality related studies were completed since 2000 in this watershed.

- Bill Williams Watershed Plan and Characterization (2005) Nonpoint Education for Municipal Officials (NEMO) Program, which is affiliated with the University of Arizona, in cooperation with ADEQ (2005)
 - A watershed protection and remediation plan that identifies and quantitatively ranks subwatersheds that are most susceptible to water quality contaminants, specifically; metals, sediment, nutrients, and selenium. The plan also identifies management measures that should be implemented to improve water quality in high risk subwatersheds.
- Hydrologic Conditions In the Bill Williams River National Wildlife Refuge and Planet Valley, Arizona, 2000 - Richard P. Wilson and Sandra J. Owen-Joyce, U.S. Geological Survey in cooperation with the U.S. Fish and Wildlife Service and the Bureau of Reclamation (2002) This was an investigation of the current hydrologic conditions along the Bill Williams River, and a delineation of the water table. It included an inventory of wells within the river aquifer of the Colorado River and in Planet Valley.
- Structural Controls on Ground Water Conditions and Estimated Aquifer Properties near Biil Williams Mountain, Williams, Arizona - Herbert A. Pierce, U.S. Geological Survey in cooperation with the City of Williams (2001) This is a description of the hydro-geologic units and ground water conditions in the regional aquifer near Williams. Arizona. It identifies regional geologic structural features that in part control

ground water conditions, and presents estimated properties of the regional aquifer.

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Assessments

The Bill Williams Watershed can be separated into the following drainage areas in Arizona:

15030201	Big Sandy River
15030202	Burro Creek
15030203	Santa Maria River
15030204	Bill Williams River

These drainage areas and the surface waters assessed as "attaining" or "impaired" are illustrated on the following watershed map. Methods used to complete these assessments are described in the "Surface Water Assessment Methods and Technical Support" document (2006).

Assessment Map			

ALAMO LAKE 15030204 – 0040A	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
14,150 Acres	A D E Q	A&Ww – Impaired FBC – Impaired FC – Inconclusive AgL – Impaired	Category 5	High pH, ammonia, and low dissolved oxygen	Add low dissolved oxygen to the 303(d) list. High pH listed in 1996. Ammonia listed in 2004.
-	E P A	A&Ww – Impaired FC – Impaired (Affected uses only)	Category 5	Mercury in fish tissue.	EPA listed mercury in 2002. Mercury TMDL should be completed in 2006.

MONITORING U	SED IN THIS	SASSESSMENT		
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/10/2000 – NUMBER AND TYPES OF SAMPLE		
DATABASE #		Metals	Nutrients – Related	Other
At dam BWALA – A USFWS AL-1 101351	ADEQ and USFWS/CoE Ambient ADEQ TMDL	14-67 total and 8-15 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc	122-173 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total	1 E. coli bacteria 14 Fluorine 40 Total dissolved solids 6 Suspended sediment
Mid lake BWALA - B USFWS AL-2 101351	ADEQ and USFWS/CoE Ambient ADEQ TMDL	208 total and 21 dissolved: Mercury	Kjeldahl nitrogen, dissolved oxygen, and pH	concentration 6 Turbidity
Mid lake – North end BWALA – C USFWS AL-3 102514	ADEQ and USFWS/CoE Ambient ADEQ TMDL			
Above Alamo Lake, near Brown's crossing BWBWR045.08 102307	ADEQ TMDL			

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Ammonia	0.25 mg/L at pH 10.0 and temp 25.6 C 0.21 mg/L at pH 10.1 and temp 26.8 C A&Ww chronic	06/12/2000 - 0.6 mg/L 09/18/2000 - 0.3 mg/L	Remains impaired - 2 exceedances during the assessment period.
Dissolved oxygen	6.0 mg/L (top meter) A&Ww	11/13/2000 - 5.5 mg/L 12/03/2001 - 3.3 mg/L 04/08/2002 - 1.5 mg/L 05/07/2002 - 1.8 mg/L 12/09/2002 - 4.4 mg/L 11/01/2003 - 1.9 mg/L 09/20/2004 - 4.0 mg/L 09/28/2004 - 4.9 mg/L 11/23/2004 - 5.5 mg/L	Impaired – Low dissolved oxygen in 9 of 60 sampling events (93 of 173 samples – binomial). (When multiple sites were sampled, the lowest DO is shown for that date.) (Binomial)

Mercury	0.01 µg/L	09/28/2004 – 0.016	Inconclusive – Only 1 exceedance in during the assessment period. (EPA listing of mercury is based on fish consumption advisory and not chemistry. See mercury discussion below.)
(dissolved)	A&Ww Chronic	μg/L	
pH (high)	<9.0 SU A&Ww, FBC, AgL	01/10/2000 - 9.7 SU 04/17/2000 - 9.8 SU 06/12/2000 - 10.0 SU 09/08/2000 - 10.2 SU 04/09/2001 - 10.0 SU 06/17/2002 - 10.0SU 07/07/2002 - 10.3 SU 05/19/2003 - 10.1 SU 06/09/2003 - 10.2 SU 01/12/2004 - 9.7 SU	Remains impaired – High pH values in 10 of 60 sampling events (42 of 173 samples) (binomial).

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site,

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW	
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH	
Mercury	Insufficient <i>E. coli</i> bacteria to assess FBC		Lab detection limit for dissolved mercury was higher than chronic criterion.	
DISCUSSION OF MERCURY IMPAIRMENT		 Evidence of potential mercury impairment: The mercury fish consumption advisory issued in 2004 is still in effect; Potential sources of mercury in the watershed; Several tributaries in the watershed have exceedances of mercury standards; Santa Maria River (a tributary to Alamo Lake) is listed as impaired due to mercury; and The mercury TMDL for Alamo Lake ishould be completed in early 2007. ADEQ cannot list Alamo Lake as impaired based on narrative toxic standards due to statutory constraints described in the Assessment Methods document. 		
MONITORING RECOMMEN	IDATIONS	support TMDL development elevated ammonia may be methods for implementing applied to this lake once an utrient violations are occur. Complete development of detection limit for dissolver	the mercury TMDL. Use a lower lab	

BIG SANDY RIVER	USE SUPPORT	OVERALL ASSESSMENT	1
From Sycamore Wash to Burro Creek 15030201 004 13.8 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 02/15/2000 – 05/17/2005			
DATABASE #		NUMBER AND TYPES OF SAMP			
		Metals	Nutrients - Related	Other	
Highway 93 bridge BWB\$R034.68 100400	ADEQ Ambient	8-23 total and 5-23 dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, thallium, and zinc 31 total and 20 dissolved: Mercury 28 total metals only: Boron and	22-28 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	21 E. coli bacteria 23 Fluoride 22 Total dissolved solids 15 Suspended sediment concentration 25 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	21.6 µg/L at 280 mg/L hardness A&Ww chronic	05/07/2001 – 26 μg/L	Inconclusive – Only 1 exceedance during the assessment period.
Dissolved oxygen	6.0 mg/L A&W/w	05/07/2001 – 4.9 mg/L 07/31/2003 – 5.0 mg/L 09/16/2003 – 5.3 mg/L 09/19/2004 – 5.5 mg/L 09/28/2004 – 5.5 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling and lack of riffle in 4 samples. Low DO on 09/19/2004 was during flood flow (30,000 cfs as compared to normal of 1-6 cfs); therefore, only 1 of 26 samples did not meet the criterion and that was during a flood flow. (Binomial)
E. coli bacteria	235 CFU/100 ml FBC	02/23/2005 – 620 CFU/100 ml	Inconclusive – Only 1 exceedance. Note that the exceedance occurred during flood flow – 1978 cfs, while normal is 1-6 cfs.
Lead	15 μg/L FBC	02/23/2005 – 27 μg/L	Attaining – Only 1 exceedance in 22 samples (Binomial)
Mercury	0.6 μg/L FC	(10/04/2002 – 0.86 μg/L)* 1/23/2003 – 0.92 μg/L 09/19/2004 – 2.7 μg/L	Inconclusive – Only 2 exceedances in 13 samples (Binomial) *Samples starting in 2003 superseded prior samples because more reliable methods were used to collect and analyze the data.
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	02/23/2004 – 227 mg/L 10/21/2004 – 9900 mg/L 12/29/2004 – 1735 mg/L 01/05/2005 – 1680 mg/L 02/23/2005 – 2360 mg/L	Inconclusive – 4 of the 5 samples that exceeded the 80 mg/L occurred during high flows so could not be used in the geometric mean calculation. 227 mg/L was occurring during normal flow. Geometric mean standard was not exceeded. (Note that exceedances occurred during 4 of 5 consecutive months monitored.)

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMIT'S NOT LOW ENOUGH
E. coli bacteria, mercury, and suspended sediment. Collected all core parameters			Lab detection limits for selenium and most of the dissolved mercury samples were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Use a lower lab detection The high suspended sedime transport. Recommend using	E. coli bacteria, mercury, and suspended sediment to exceedances. limit for selenium and dissolved mercury ent concentration indicates heavy sedimenting biocriteria assessments and bottom deposits in this reach, when they are adopted.

BIG SANDY RIVER	USE SUPPORT	OVERALL ASSESSMENT
From Rupley Wash to Alamo Lake 15030201 001 10.2 Miles	A&Ww - Inconclusive FBC - Attaining FC - Attaining AgL - Attaining	Category 2 Attaining some uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/02/2002 – 01/27/2004			
DATABASE #		NUMBER AND TYPES OF SAME	LES		
		Metals	Nutrients - Related	Other	
Near Wikieup, AZ BWB\$R015.60 100457	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc	4-5 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment	
		4 total metals only: Boron, lead, manganese	Kjeldahl nitrogen, dissolved oxygen, and pH	concentration 5 Turbidity	
		6 total and 3 dissolved: Mercury			

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&W/w	10/02/2002 – 5.2 mg/L 12/04/2002 – 5.4 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	02/24/2005 – 0.013 μg/L	Inconclusive - Criterion exceeded once during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Collected all core parameters		Lab detection limits for selenium and half of the dissolved mercury samples were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Monitor for mercury due to the exceedances. Use lower lab detection limits for selenium and dissolved mercury.	

BILL WILLIAMS RIVER From Alamo Lake to Castaneda	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Wash 15030204 003 35.9 Miles	A&Ww – Impaired FBC – Impaired FC – Attaining AgL – Impaired	Category 5	Ammonia, low dissolved oxygen, and high pH	Add ammonia, low dissolved oxygen, and high pH to the 303(d) List

SITE NAMES	AGENCY	SAMPLING PERIOD: 01/01/2000 – 11/20/2004				
ID#	PURPOSE	NUMBER AND TYPES OF SAMPL	ES			
DATABASE #		Metals	Nutrients - Related	Other		
Below Alamo Lake Dam BWBWR038.52 102316	USFWS Ambient and ADEQ TMDL	4-16 total metals only: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, manganese, mercury, nickel, selenium, silver, thallium, and zinc	36-56 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, dissolved oxygen, and pH	5 Suspended sedimen concentration 5 Turbidity		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Ammonia	0.39 mg/L at pH 9.4 and temp 18.6 C 0.46 mg/L at pH 9.2 and temp 15.5 C 0.39 mg/L at pH 9.3 and temp 17.9 C 0.49 mg/L at pH 8.8 and temp 18.5 C 0.43 mg/L at pH 9.0 and temp 16.3 C 0.47 mg/L at pH 9.0 and temp 15.7 C 0.53 mg/L at pH 9.0 and temp 15.7 C 0.31 mg/L at pH 9.0 and temp 21.8 C A&Ww chronic	06/12/2000 - 0.6 mg/L 10/15/2001 - 0.5 mg/L 07/21/2003 - 0.4 mg/L 08/18/2003 - 0.6 mg/L 09/08/2003 - 0.8 mg/L 06/07/2004 - 0.7 mg/L 07/07/2004 - 0.7 mg/L 09/20/2004 - 0.7 mg/L	Impaired –8 exceedances during the assessment period.
Dissolved oxygen	6.0 mg/L A&Ww	04/08/2002 - 2.7 mg/L 05/07/2002 - 1.7 mg/L 10/27/2002 - 3.6 mg/L 08/18/2003 - 4.8 mg/L 09/08/2003 - 5.0 mg/L 10/06/2003 - 5.5 mg/L 11/01/2003 - 4.0 mg/L 12/15/2003 - 5.0 mg/L 08/09/2004 - 4.7 mg/L 09/20/2004 - 0.7 mg/L	Impaired – Low dissolved oxygen in 10 of 55 samples (binomial).
Lead	15 mg/L FBC	10/27/2004 - 19.0 mg/L	Inconclusive – Only 1 exceedance in 2 sampling events
pH (high)	<9.0 SU A&Ww, FBC, AgL	04/17/2000 - 10.0 SU 06/12/2000 - 10.4 SU 09/18/2000 - 10.2 SU 04/09/2001 - 10.0 SU 05/07/2001 - 10.3 SU 10/15/2001 - 9.2 SU 06/17/2002 - 10.4 SU 07/07/2002 - 10.6 SU 07/21/2003 - 9.3 SU 01/12/2004 - 10.0 SU	Impaired – High pH values in 11 of 56 samples (binomial).

Suspended sediment concentration Geometric mean 80 mg/L A&Ww	10/27/2004 – 448 mg/L 11/24/2004 – 193 mg/L	Inconclusive – Exceeded standards during both sampling events (3 of 5 samples). Insufficient samples to calculate the geometric mean (need a minimum of 4 samples).
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Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

fficient <i>E. coli</i> bacteria, olved metals (cadmium, per, zinc) to assess FBC A&Ww		
ONS		
MONITORING RECOMMENDATIONS		olved oxygen, pH, and ammonia samples to nt. Coordinate TMDL developed for this all exceedances occurred just below the dam
	exceedances. Recommend using biocrites	ria assessments and bottom deposits

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BILL WILLIAMS RIVER

From point B to Colorado River 15030204 -- 001 17.5 Miles

USE SUPPORT	OVERALL ASSESSMENT	- V	
A&Ww – Attaining FBC – Attaining	Category 1		
FC - Attaining AgL - Attaining	Attaining all uses		

SITE NAMES AGENC		SAMPLING PERIOD: 01/25/2000 -		
DATABASE #		NUMBER AND TYPES OF SAMPLE		
		Metals	Nutrients - Related	Other
At Mineral Wash near Planet BWBWR009.92 100924	USGS Ambient	3 total and 3-13 dissolved metals: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc 2 total and 13 dissolved: Barium, chromium, nickel, and silver 3 total only: Mercury	3-13 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, dissolved oxygen, and pH	8 <i>E. coli</i> bacteria 12 Fluorine 6 Suspended sediment concentration 4 Turbidity

EXCEEDANCES	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	05/15/2002 – 5.3 mg/L 08/26/2003 – 2.2 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water recharge.
Suspended sediment concentration	Geometric mean 80 mg/L A&W/w	01/30/2003 - 95 mg/L 05/28/2003 - 83 mg/L 05/26/2004 - 121 mg/L	Attaining – Although 3 samples exceeded the 80 mg/L criterion, a rolling geometric mean of 4 consecutive samples did <u>not</u> exceed the standard.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		
MONITORING RECOMMEN	IDATIONS	exceeded during low	he 80 mg/L criterion for suspended sediment was flows, recommend using biocriteria assessments implementation procedures in this reach, when

Boulder Creek run - 10-17 (none)

20-25 (middle)

Colymposius (olleated in the

the food rethert Season of the

period rethert Season of thous

- the rest of the year = indep
endert pools separated by uty

streetches.

(why 2-3 sorpole sets represent flow

on withins) - Oct. we now or may not

BOULDER CREEK From unnamed tributary at		E SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
344114 / 1131800 to Wilder Creek 15030202 – 006B	A D E Q	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2 Attaining Some Uses		
14.4 Miles	E P A	A&Ww - Impaired (Affected use only)	Category 5	Mercury	EPA listed mercury in 2004. (See mercury discussion below)

SITE NAMES	AGENCY	SAMPLING PERIOD: 02/10/2000	0 - 08/04/2005	
ID # PURPOSE DATABASE #	4-day mercury samples: 06/20- 06/23/2005; 08/01-08/04/2005; 10/24-10/27/2005; 2/6-2/9/2006; 5/1-5/4/2006			
		NUMBER AND TYPES OF SAMP	LES	
		Metals	Nutrients - Related	Other
At Wild Horse Basin BWBOU017.35 102022	ADEQ TMDL	16 total and 36 dissolved: Mercury (grab samples)	7 Dissolved oxygen and 50 pH	3 Suspended sediment concentration 2 Turbidity
Below Warm Spring Creek Tungstona 1 BWBOU013.05 102019	Phelps Dodge Ambient	Five 4-day mercury sampling events 9-23 total and 9-14dissolved metals: Arsenic, beryllium, chromium, copper, lead, manganese, and zinc 14 total metals only: Cadmium, selenium, silver		
Below Tungstona Mine Tungstona 2 BWBOU012.82 102233	Phelps Dodge Ambient			
Uppermost project site Site N BWBOU009.00 101015	ADEQ TMDL			
Above Hillside Mine Hillside 2 BWBOU008.92 100401	Phelps Dodge Ambient			

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE COMMENTS
Beryllium	65 µg/L A&Ww acute	08/16/2001 – 94 μg/L	Inconclusive – 1 exceedance i monitoring.
Mercury	0.6 μg/L FC	09/10/2002 – 3.4 μg/L	Attaining – 1 exceedance in 8 (Binomial)
Mercury (dissolved)	0.01 µg/L A&Ww chronic	(08/23/2000 – 0.3 μg/L) (03/05/2002 – 0.3 μg/L) (04/18/2002 – 0.2 μg/L)	*Samples starting in 2003 su samples because more reliab
		$(09/10/2002 - 0.2 \mu g/L)$ $(09/10/2002 - 2.7 \mu g/L \#)$ $(11/20/2002 - 0.2 \mu g/L)$	used to collect and analyze t # 2.7 is the mean of three m
		02/23/2004 – 0.018 μg/L	collected on 09/10/2002 (1.8 µg/L). See mercury discussion belov

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BOULDER CREEK From unnamed tributary at		E SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
344114 / 1131800 to Wilder Creek 15030202 – 006B 14.4 Miles	ADEQ	A&Ww - Inconclusive FBC - Inconclusive FC - Attaining AgL - Attaining	Category 2 Attaining Some Uses		-
14.4 Miles	E P A	A&Ww – Impaired (Affected use only)	Category 5	Mercury	EPA listed mercury in 2004. (See mercury discussion below)

SITE NAMES	AGENCY	SAMPLING PERIOD: 02/10/2000	0 - 08/04/2005				
ID#	PURPOSE	4-day mercury samples: 06/20-0	06/23/2005; 08/01-08/	04/2005; 10/24-			
DATABASE #		10/27/2005; 2/6-2/9/2006; 5/1-5/4/2006					
		NUMBER AND TYPES OF SAMP	LES				
		Metals	Nutrients – Related	Other			
At Wild Horse Basin BWBOU017.35 102022	ADEQ TMDL	16 total and 36 dissolved: Mercury (grab samples)	7 Dissolved oxygen and 50 pH	3 Suspended sediment concentration 2 Turbidity			
Below Warm Spring Creek Tungstona 1 BWBOU013.05 102019	Phelps Dodge Ambient	Five 4-day mercury sampling events 9-23 total and 9-14dissolved metals: Arsenic, beryllium, chromium, copper, lead, manganese, and zinc 14 total metals only: Cadmium, selenium, silver					
Below Tungstona Mine Tungstona 2 BWBOU012.82 102233	Phelps Dodge Ambient						
Uppermost project site Site N BWBOU009.00 101015	ADEQ TMDL						
Above Hillside Mine Hillside 2 BWBOU008.92 100401	Phelps Dodge Ambient						

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Beryllium	65 μg/L A&Ww acute	08/16/2001 – 94 μg/L	Inconclusive – 1 exceedance in the last 3 year of monitoring.
Mercury	0.6 μg/L FC	09/10/2002 – 3.4 μg/L	Attaining – 1 exceedance in 8 sampling events. (Binomial)
Mercury (dissolved)	0.01 µg/L A&Ww chronic	(08/23/2000 – 0.3 μg/L) (03/05/2002 – 0.3 μg/L) (04/18/2002 – 0.2 μg/L) (09/10/2002 – 2.7 μg/L#) (11/20/2002 – 0.2 μg/L) 02/23/2004 – 0.018 μg/L	Inconclusive –Only 1 exceedance is counted. *Samples starting in 2003 superseded prior samples because more reliable methods were used to collect and analyze the data. # 2.7 is the mean of three mercury samples collected on 09/10/2002 (1.8, 2.9, and 3.4) µg/L). See mercury discussion below.

Suspended sediment concentration (SSC) Geometric mean 80 mg/L A&Ww	09/19/2004 – 4554 mg/L 10/22/2004 – 432 mg/L	Inconclusive – Both exceedances occurred during high flows, so could not be used for geometric mean calculation. Insufficient samples left to apply the standard.
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EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
Beryllium, mercury, and suspended sediment concentration	Insufficient E. coli bacteria to assess FBC		Lab detection limits for dissolved copper and lead were above A&W chronic criteria in at least 6 samples.
MERCURY IMPAIRMENT DIS		2003-2006 by ADEQ and laboratories to accurately and more reliable data wa assessment, and in this case. Five sets of 4-day mercury considered in this assessment assessment period (newer The exceedance on 02/23, and an old mining operation of the exceedance on 02/23, and an old mining operation of the exceedance of potential mercury to sediment and water column is 2. Mercury fish cor 3. One exceedance consumption; and 4. Historic mining Although there is evidence more reliable field and lab the reach as impaired.	s were used for mercury samples collected in Phelps Dodge. These techniques allow report results as low as 0.00025 µg/L. This newers therefore given a higher weight in the superseded previously collected data. samples collected by Phelps Dodge were not although several sets were collected after the data). No exceedances occurred in these datasets. (2004 (0.018 µg/L) occurred at Wild Horse Basin on exists in this area. storm flows did not represent chronic conditions, chronic criteria for this assessment. sury impairment: detections in this reach. Mercury readily adheres tissue, and therefore, the detection of it in the unlikely and therefore significant. sumption advisory downstream at Alamo Lake; of the total mercury standard for fish
MONITORING RECOMMEN	DATIONS	concentration samples due Collect core parameters to	mercury, beryllium, and suspended sediment to the exceedances. represent at least 3 seasons during an assessment ection limits for dissolved copper and lead.

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BOULDER CREEK From Wilder Creek to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Butte Creek 15030202 - 005A 1.4 Miles (Since last assessment, split reach 005A into 005A&B, and changed 005B to	A&Ww – Impaired FBC – Impaired FC – Inconclusive Agl – Impaired AgL – Impaired	Category 4A (arsenic, copper, zinc) Category 4B (beryllium, low pH, manganese) Not attaining (Impaired)	Beryllium, low pH, manganese, arsenic, copper, and zinc	Add beryllium, manganese, and low pH to 4B. TMDLs for arsenic, copper, and zinc were completed in 2004.
005C)	A&Ww - Impaired (Affected use only)	Category 5 Mercury	Mercury	EPA listed mercury in 2004.

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/10/2000 – 08/04/2005 4-day mercury samples: 11/29-12/02/2004; 06/20-06/23/2005; 08/01-08/04/2005; 10/24-10/27/2005; 2/6-2/9/2006; 5/1-5/4/2006 NUMBER AND TYPES OF SAMPLES			
Below Wilder Creek – Site L BWBOU008.62 101013 Hillside Mine upper tailings BWBOU008.53 102232 NW edge upper tailings BWBOU008.49 102231 Above Hillside Mine BWBOU008.42 102023 Upstream of tailings Site JJ BWBOU008.28 101439 Above Hillside middle tailings BWBOU007.98 102226 Amid tailings (mid + up) Site J	ADEQ TMDL ADEQ TMDL ADEQ TMDL ADEQ TMDL ADEQ TMDL ADEQ TMDL ADEQ TMDL ADEQ			Other 2 Fluoride 10 Suspended sediment concentration 4 Turbidity	
BWBOU007.92 101012 At Hillside adit BWBOU007.83 102024 Amid tailings (mid + low)Site-H BWBOU007.76 101011 Below middle tailings piles BWBOU007.59 102227 Between mid and lower tailings BWBOU007.55 102228 Above lower tailings pile BWBOU007.49 102229 Near lower tailings pile BWBOU007.43 102230	ADEQ TMDL				

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relow tailings piles - Site G WBOU007.13 01010	ADEQ TMDL
Above Butte Creek Hillside 1 BWBOU006.57 102223	Phelps Dodge Ambient

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L – FBC 200 μg/L – AgL 1450 μg/L – FC 2000 μg/L – AgI	Too many exceedances to list here.	Remains impaired – Exceedances occurred during all 23 sampling events (Binomial) Maximum concentration was 11,400 µg/L. Highest values were at site 102024. Exceedances occurred at several other sites.
Beryllium	5.3 µg/L A&Ww chronic	10/26/2000 – 63 µg/L 03/27/2001 – 6.0 µg/L 04/25/2001 – 6.0 µg/L 05/22/2001 – 6.0 µg/L 08/15/2001 – 31 µg/L 08/28/2001 – 19 µg/L 11/02/2001 – 5.5 µg/L	Impaired – Exceeded criterion during 7 sampling events during the assessment period. (Exceeded in 10 of 66 samples collected.) (See monitoring site discussion below)
Copper	500 µg/L – AgL 1300 µg/L – FBC 5000 µg/L – AgI	10/26/2000 – 36,000 µg/L 08/15/2001 – 36,000 µg/L 08/28/2001 – 115,000 µg/L	Attaining – Exceeded steindards in 6 of 73 samples (only 3 monitoring events). (Binomial)
Copper (dissolved)	49.6 µg/L at >400 mg/L hardness 9.8 µg/L at 72 mg/L hardness 49.6 µg/L at >400 mg/L hardness 49.6 µg/L at >400 mg/L hardness 30,7 µg/L at 240 mg/L hardness AGWW chronic	10/26/2000 - 39,000 µg/L 01/30/2001 - 80 µg/L 08/15/2001 - 33,100 µg/L 08/28/2001 - 114,000 µg/L 12/31/2001 - 90 µg/L	Remains impaired – Exceeded calculated standard five times during the assessment period.
Dissolved oxygen	6.0 mg/L A&W/w	Too many to list here. Low dissolved oxygen values in 11 of 15 sampling events.	Attaining - Low disolved oxygen due to low flow and ground water upwelling.
Lead	15 μg/L FBC	01/30/2001 – 30 μg/L 02/27/2001 – 17 μg/L 08/15/2001 – 24 μg/L	Attaining – 3 of 62 sam ples exceeded criterion.
Manganese	10,000 μg/L Agl 196,000 μg/L FBC	Too many exceedances to list here.	Impaired – 22 of 74 samples exceeded standards. (14 of 20 sampling events). (Binomial) Highest value was 367,000 µg/L. High concentrations we're found at several sites. (See monitoring site discussion below.)
Mercury	0.6 μg/L – FC 10 μg/L – AgL	(09/10/2002 – 3.8 μg/L)** 08/23/2003 – 98 μg/L*	Attaining – 1 exceedance in 11 sampling events. (binomial approad) ** Data collected before more reliable sampling techniques. *98 µg/L is the mean value of 3 sar nples collected below the tailings.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	(03/21/2001 – 0.2 μg/L) (9/10/2002 – 3.8 μg/L) *09/25/2003 – 0.0365 μg/L	Inconclusive – Only 1 e: xceedance is counted (*09/25/2003). *Samples starting in 2003 superseded prior samples because more reliable methods were used to collect and analyze the data. (See mercury discussion below)
рН	<9.0 SU A&Ww, FBC, AgL, AgI >6.5 SU A&Ww, FBC, AgL	08/22/2000 - 9.5 SU 10/26/2000 - 2.6 SU 01/30/2001 - 6.2 SU 03/27/2001 - 5.6 SU 04/25/2001 - 6.0 SU 05/22/2001 - 6.0 SU 06/26/2001 - 5.7 SU 08/15/2001 - 3.7 SU 08/28/2001 - 11.7 SU 08/28/2001 - 2.4 SU 11/02/2001 - 5.9 SU	Impaired – Exceeded criteria in 25 of 87 samples (12 of 30 samp ling events). (Binomial) (See monitoring site discussion below.)

		09/25/2003 – 1.9 SU	
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	08/23/2003 – 48,627 mg/L 09/19/2004 – 1,443 mg/L 10/21/2004 – 1,747 mg/L	Attaining—All exceedances of the 80 mg/L criterion were during high flow events so could not be included in the geometric mean. Geometric mean was not exceeded.
Zinc	10,000 – AgI 25,000 – AgL 69,000 – FC	10/26/2000 – 160,000 μg/L 08/15/2001 – 184,000 μg/L 08/28/2001 – 692,000 μg/L	Attaining – 8 of 66 samples exceeded (3 of 24 sampling events). (Binomial) However, magnitude of the exceedances should be noted.
Zinc (dissolved)	379 μg/L at >400 mg/L hardness 379 μg/L at >400 mg/L hardness 379 μg/L at >400 mg/L hardness A&Ww acute	Too many to list here	Remains impaired – Exceeded criteria 13 times during the last 3 years of monitoring. Highest concentration was 262,000 µg/L. Exceedances occurred during all 17 sampling events.

Pollutant: Assume "total" concen Frequency Exceed = Samples coll			as one sample per site.
DATA GAPS AND MO			ar end cample per mer
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	E. coli bacteria		Lab detection limits for dissolved metals (copper, lead) and selenium were higher than chronic criteria in 6-35 samples.
Acute Us.	Shoth?)	m He	re in Category 4A because TMDLs have been neters. Proposed remediation of historic mine of should mitigate the metal loadings (including low pH; therefore, beryllium, manganese, and 48.
Acute stul-	as?) epo	Short-tem	s were used for mercury samples collected in Phelps Dodge. These techniques allow report results as low as 0.00025 µg/L. This newer is therefore given a higher weight in the

amples collected by Phelps Dodge were nt although several sets were collected after the lata). No exceedances occurred in these datasets. occurred near Hillside Mine's upper tailings site /L).

> orm flows did not represent chronic conditions, pronic criteria for this assessment.

ry impairment:

detections in this reach. Mercury readily adheres tissue, and therefore, the detection of it in the unlikely and therefore significant. isumption advisory downstream at Alamo Lake; of the total mercury standard for fish ıd

ources in the reach.

t evidence of impairment, only one exceedance I and laboratory methods is insufficient for impaired.

nercury TMDL should be completed in 2007 and e Burro Creek drainage area (that includes

representative ercury samples due to exceedances. Collect manganese, mercury, zinc, and pH samples during critical conditions and in critical locations, once strategies are implemented to reduce loadings. Collect core parameters to represent at least 3 seasons during an assessment period. Use lower lab reporting limits for selenium and dissolved metals.

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		09/25/2003 - 1.9 SU	
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	08/23/2003 – 48,627 mg/L 09/19/2004 – 1,443 mg/L 10/21/2004 – 1,747 mg/L	Attaining—All exceedances of the 80 mg/L criterion were during high flow events so could not be included in the geometric mean. Geometric mean was not exceeded.
Zinc	10,000 – Agl 25,000 – AgL 69,000 – FC	10/26/2000 – 160,000 μg/L 08/15/2001 – 184,000 μg/L 08/28/2001 – 692,000 μg/L	Attaining – 8 of 66 samples exceeded (3 of 24 sampling events). (Binomial) However, magnitude of the exceedances should be noted.
Zinc (dissolved)	379 µg/L at >400 mg/L hardness 379 µg/L at >400 mg/L hardness 379 µg/L at >400 mg/L hardness A&Ww acute	Too many to list here	Remains impaired – Exceeded criteria 13 times during the last 3 years of monitoring. Highest concentration was 262,000 µg/L. Exceedances occurred during all 17 sampling events.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	E. coli bacteria		Lab detection limits for dissolved metals (copper, lead) and selenium were higher than chronic criteria in 6-35 samples.
DISCUSSION OF ASSESSMEN REMEDIATION EFFORTS, AN MONITORING DATA FROM INTERMITTENT STREAM	ND USE OF	completed for these paratailings along Boulder Cremercury loadings) and the low pH are listed Categor. Ultra clean field technique 2003-2006 by ADEQ and laboratories to accurately and more reliable data wassessment, and in this cases with the same assessment period (newer However, one exceedance on 09/25/2003 (0.0365). Samples collected during so were not compared to Evidence of potential me 1. Several mercur to sediment an water column 2. Mercury fish co. 3. One exceedance consumption; 4. Historic mining Although there is significated using the more reliable file Arizona to list the reach and Note that the Alamo Lake.	es were used for mercury samples collected in it Phelps Dodge. These techniques allow report results as low as 0.00025 µg/L. This newer as therefore given a higher weight in the se superseded previously collected data. samples collected by Phelps Dodge were ent although several sets were collected after the data). No exceedances occurred in these datasets. See occurred near Hillside Mine's upper tailings site ug/L). storm flows did not represent chronic conditions, ochronic criteria for this assessment. recury impairment: y detections in this reach. Mercury readily adheres d tissue, and therefore, the detection of it in the is unlikely and therefore significant. Insumption advisory downstream at Alamo Lake; see of the total mercury standard for fish and g sources in the reach.
MONITORING RECOMMEN	IDATIONS	arsenic, beryllium, coppe during critical conditions implemented to reduce le	mercury samples due to exceedances. Collect r, manganese, mercury, zinc, and pH samples and in critical locations, once strategies are badings. Collect core parameters to represent at assessment period. Use lower lab reporting limits and metals.



BOULDER CREEK From Butte Creek to Copper	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Creek 15030202 – 005B	A&Ww – Inconclusive FBC – Impaired FC – Inconclusive AgL – Attaining	Category 4A Not attaining (Impaired)	Arsenic	TMDL for arsenic and copper was completed in 2004.

SITE NAMES	AGENCY	SAMPLING PERIOD: 02/10/2000 - 08/04/2005			
ID # DATABASE #	PURPOSE	4-day mercury samples: 11/2 08/04/2005; 10/24-10/27/2 NUMBER AND TYPES OF S.	005; 2/6-2/9/2006; 5/		
		Metals	Nutrients – Related	Other	
Below Butte Creek BWBOU006.53 102082	ADEQ TMDL	6 total and 14 dissolved (grab samples): Mercury	5 Dissolved oxygen and 20 pH		
Below Butte Creek – Site E BWBOU006.01 101009	ADEQ TMDL	3 sets of 4-day mercury samples were collected at Boulder 2 site			
Above Copper Creek Boulder 2 BWBOU005.15 102193	Phelps Dodge Ambient	6 total and 11-12 dissolved metals: Arsenic, copper, manganese, and zinc 5-6 total only: Beryllium, lead,			
		1-2 total and dissolved: Cadmium, selenium, silver			

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L – FBC	11/30/2000 - 58 µg/L 01/04/2001 - 71 µg/L 04/24/2001 - 73 µg/L 03/05/2002 - 53 µg/L	Remains impaired – Exceedances occurred in 4 of 12 sampling events (4 of 16 samples) (Binomial)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient <i>E. coli</i> bacteria, dissolved cadmium, and mercury to assess A&Ww, FBC or FC		Lab detection limits for dissolved metals (copper, lead) and selenium were higher than chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority -Collect strategies to reduce loading	arsenic samples to determine effectiveness of ng, once implemented.
		Collect core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for selenium and dissolved metals.	
		Note: No mercury exceed	lances.



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BOULDER CREEK	USE SUPPORT	OVERALL ASSESSMENT	(Since last assessment, split reach 005A into 005A&B,
Troiti copper cicek to barro cicek	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2 Attaining some	and changed 005B to 005C)

MONITORING U	SED IN THIS	ASSESSMENT		
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	4-day mercury samples: 11/29-12/02/2004; 06/20-06/23/2005; 008/04/2005; 10/24-10/27/2005; 2/6-2/9/2006; 5/1-5/4/2006		
		NUMBER AND TYPES OF SAMP		
		Metals	Nutrients - Related	Other
Below Copper Creek Boulder 1 or Site B BWBOU005.11 101008	Phelps Dodge Ambient and ADEQ TMDL	12 total and 27 dissolved: Mercury (grab samples) Six 4-day mercury samples	13 Dissolved oxygen and 41 pH	1 Suspended sediment concentration 5 Turbidity
Below Mulholland Wash Boulder 4 BWBOU002.18 102224	Phelps Dodge Ambient	9-26 total and dissolved metals: Arsenic, beryllium, chromium, copper, lead, manganese, and zinc		
Above Zana Canyon BWBOU001.51 102225	ADEQ TMDL	12 total only: Cadmium, selenium		
Above Burro Creek – Site A BWBOU000.66 101007	ADEQ Ambient			

EXCEEDANCE:			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L FBC	01/04/2001 – 52 μg/L 04/24/2001 – 58 μg/L	Attaining – 2 of 17 samples exceeded the criterion (binomial).
Dissolved oxygen	mg/L A&Ww	05/23/2001 – 3.9 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling.
Lead	15 μg/L FBC	02/28/2001 – 34 μg/L	Attaining - Only 1 exceedance in 14 samples.
Mercury	0.6 μg/L FC	(09/10/2002 – 7.2 μg/L)*	Attaining -*No exceedances in 8 sampling events using more reliable sampling techniques. (binomial).
Mercury (dissolved)	0.01 μg/L A&Ww chronic	(09/10/2002 – 7.2 μg/L)*	Attaining – -*No exceedances in 8 sampling events using more reliable sampling techniques.
pН	<9.0 SU A&Ww, FBC, AgL	08/23/2000 – 9.4 SU	Attaining – Only 1 exceedance in 41 samples (binomial)
Selenium	2.0 μg/L A&Ww chronic	03/04/2002 – 3.0 μg/L	Inconclusive— One exceedance during the assessment period. Exceedance in the prior year is only slightly over the standard.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEED	os	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Insufficient <i>E. coli</i> bacteria to assess FBC.		
MONITORING RECOMMEN	DATIONS		additional selenium samples due to the parameters to represent at least 3 seasons during

BRIDLE CREEK	USE SUPPORT	OVERALL ASSESSMENT	nedo-lar-etterres
From headwaters to Santa Maria River 15030203 – 027 25.8 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3 Inconclusive	ALL THE STATE OF T

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 09/09/2003 – 01/05/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above Highway 97 BWBRI016.91 102310	ADEQ TMDL	6 total metal and 4 dissolved: Mercury	1 Dissolved oxygen, 6 pH	1 Fluoride 5 Suspended sediment concentration	
Below Mountain Springs BWBRI009.54 102313	ADEQ TMDL			3 Turbidity	

EXCEEDANCES	S	-	
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury	0.6 μg/L FC	09/09/2003 – 0.63 μg/L	Inconclusive – Only 1 exceedance in 6 samples (binomial).
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	08/17/2004 – 4440 mg/L 09/19/2004 – 1026 mg/L 10/21/2004 – 530 mg/L 01/06/2005 – 8616 mg/L	Inconclusive – Exceedances occurred during all 4 sampling events; however, samples were collected during higher flows, so could not be included in the Geometric mean calculation. Geometric mean was not exceeded.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury and suspended sediment	Insufficient dissolved metals (cadmium, copper, zinc), E. coli bacteria, total copper and total lead to assess A&Ww, FBC, and FC	Insufficient monitoring events	
MONITORING RECOMMENDATIONS		Medium Priority -Collect m to exceedances.	nercury and suspended sediment samples due
		Collect core parameters to assessment period.	represent at least 3 seasons during an
			e heavy sediment transport. Recommend using bottom deposits implementation procedures in dopted.

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BURRO CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Francis Creek to Boulder Creek 15030202 – 008 13.8 Miles	A&Ww - Inconclusive FBC - Inconclusive FC - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES	AGENCY	SAMPLING PERIOD: 02/10/2000 – 08/04/2005				
ID#	PURPOSE	4-day mercury samples: 06/20-06/23/2005; 08/01-08/04/2005; 10/3				
DATABASE #		10/27/2005; 2/6-2/9/2006; 5/1-5/4/2006				
		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients Related	Other		
Above Boulder Creek Burro 3 BWBRO029.91 100404	Phelps Dodge Ambient and ADEQ TMDL	5 total and 15 dissolved metals: Chromium, mercury Five sets of 4-day mercury samples 5-6 total only: Arsenic, cadmium, copper, manganese, selenium, silver, and zinc.	1 Dissolved oxygen and 17 pH	1 Suspended sediment concentration 1 Turbidity		
		copper, manganese, selenium,				
		1 total only: Beryllium				

EXCEEDANCE	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Chromium	100 µg/L FBC	09/09/2002 – 150 μg/L	Inconclusive – 1 of 6 samples exceeded the criterion (binomial).

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Chromium	Insufficient dissolved metals (cadmium, copper, zinc), E. coli bacteria, boron and lead to assess designated uses		
MONITORING RECOMMENDATIONS		Medium Priority – Collect of	thromium samples due to the exceedances.
		Collect core parameters to assessment period.	represent at least 3 seasons during an
			y exceedances since "clean hands" field and applied. This includes the last 3 years of

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BURRO CREEK From Boulder Creek to Black Canyon Creek 15030202 – 004 17.2 Miles	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A A&Ww - Attaining D FBC - Inconclusive E FC - Attaining Q AgL - Attaining	Category 2		
	E A&Ww - Impaired P (Affected use only) A	Category 5	Mercury	EPA listed mercury in 2004.

SITE NAMES	AGENCY	SAMPLING PERIOD: 02/10/200	0 - 08/04/2005	
ID#	PURPOSE	4-day mercury samples: 11/29-12	/02/2004; 06/20-06/23/20	005; 08/01-
DATABASE #		08/04/2005; 10/24-10/27/2005;	2/6-2/9/2006; 5/1-5/4/200	06
		NUMBER AND TYPES OF SAME	PLES	
		Metals	Nutrients - Related	Other
Below Boulder Creek BWBRO029.27 100403	ADEQ Ambient	43 total and 51 dissolved: Mercury (grab samples)	19-30 Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, dissolved	18 <i>E. coli</i> bacteria 20 Fluoride 20 Total dissolved
Below Mammoth Wash Burro 4 BWBRO025.09 102243 Phelps Dodge Permit Ambient		Six sets of 4-day mercury samples 13-33 total and dissolved metals: Antimony, arsenic, beryllium,	oxygen 60 pH	solids 21 Suspended sediment concentration
Above Six-mile Crossing Burro 2 BWBRO023.54 102244	Phelps Dodge Permit Ambient	cadmium, chromium, copper, lead, and zinc 11-30 total metals only: Boron,		26 Turbidity
Below Six-mile Crossing BWBRO023.18	ADEO	manganese, selenium		
	17/02 0.8 mg/L	and dissolved metals: nickel, thallium, silver		
BWBRO012.95 102025	0.8 mg/L	is		

POLLUTANT	test result	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury	0.6 μg/L FC	(11/18/2002 – 0.8 μg/L) 09/19/2004 – 1.4 μg/L	Attaining – Only 1 exceedance in 18 sampling events (using more reliable monitoring techniques). (Binomial)
Mercury (dissolved)	0.01 µg/L A&Ww chronic	(02/10/2000 – 0.2 µg/L) (03/04/2002 – 0.5 µg/L) (11/18/2002 – 0.8 µg/L) (02/10/2003 – 0.2 µg/L)	Attaining – No exceedances based on newer, more reliable data. Sample results starting in June 2003 superseded prior samples because more reliable methods were used to collect and analyze the samples. (See mercury discussion below.)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	09/19/2004 – 3110 mg/L 10/22/2004 – 2385 mg/L 11/23/2004 – 83 mg/L 12/29/2004 – 1067 mg/L	Attaining – Although 4 samples exceeded the 80 mg/L criterion, all occurred during high flow events, so these measurements could not be included in the geometric mean calculation. Remaining samples did not exceed the geometric mean standard.

Pollutant: Assume "total" concentration, unless shown as dissolved.

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Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

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BURRO CREEK From Boulder Creek to Black Canyon Creek 15030202 – 004 17.2 Miles	USE	SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Ww – Attaining FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2		
	E P A	A&Ww – Impaired (Affected use only)	Category 5	Mercury	EPA listed mercury in 2004.

SITE NAMES AGENCY ID # PURPOSE DATABASE #		SAMPLING PERIOD: 02/10/2000 – 08/04/2005 4-day mercury samples: 11/29-12/02/2004; 06/20-06/23/2005; 08/01- 08/04/2005; 10/24-10/27/2005; 2/6-2/9/2006; 5/1-5/4/2006 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Below Boulder Creek BWBRO029.27 100403	ADEQ Ambient	43 total and 51 dissolved: Mercury (grab samples)	19-30 Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, dissolved	18 <i>E. coli</i> bacteria 20 Fluoride 20 Total dissolved
Below Mammoth Wash Burro 4 BWBRO025.09 102243	Phelps Dodge Permit Ambient	Six sets of 4-day mercury samples 13-33 total and dissolved metals: Antimony, arsenic, beryllium,	oxygen 60 pH	solids 21 Suspended sediment concentration
Above Six-mile Crossing Burro 2 BWBRO023.54 102244	Phelps Dodge Permit Ambient	cadmium, chromium, copper, lead, and zinc 11-30 total metals only: Boron,		26 Turbidity
Below Six-mile Crossing BWBRO023.18 101365	ADEQ Ambient	manganese, selenium 5-6 total and dissolved metals:		
At old Highway 93 bridge BWBRO012.95 102025	ADEQ TMDL	Barium, nickel, thallium, silver	,	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury	0.6 μg/L FC	(11/18/2002 – 0.8 μg/L) 09/19/2004 – 1.4 μg/L	Attaining – Only 1 exceedance in 18 sampling events (using more reliable monitoring techniques). (Binomial)
Mercury (dissolved)	0.01 µg/L A&Ww chronic	(02/10/2000 – 0.2 μg/L) (03/04/2002 – 0.5 μg/L) (11/18/2002 – 0.8 μg/L) (02/10/2003 – 0.2 μg/L)	Attaining – No exceedances based on newer, more reliable data. Sample results starting in June 2003 superseded prior samples because more reliable methods were used to collect and analyze the samples. (See mercury discussion below.)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L	09/19/2004 – 3110 mg/L 10/22/2004 – 2385 mg/L 11/23/2004 – 83 mg/L 12/29/2004 – 1067 mg/L	Attaining – Although 4 samples exceeded the 80 mg/L criterion, all occurred during high flow events, so these measurements could not be included in the geometric mean calculation. Remaining samples did not exceed the geometric mean standard.

Pollutant: Assume "total" concentration, unless shown as dissolved.

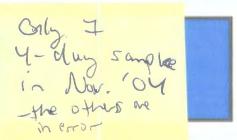
Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

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EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	E. coli bacteria		
MERCURY DISCUSSION		Ultra clean field techniques were used for mercury samples collected in 2003-2006 by ADEQ and Phelps Dodge. These techniques allow laboratories to accurately report results as low as 0.00025 µg/L. This newe and more reliable data was therefore given a higher weight in the assessment, and in this case superseded previously collected data. Six sets of 4-day mercury samples collected by Phelps Dodge were considered in this assessment although several sets were collected after the assessment period (newer data). No exceedances occurred in these datasets	
		2. Mercury fish con 3. The one exceeda during a flood flood calculated by the 4. The Alamo Lake and may provide 5. No exceedances reliable monitori Although some evidence o	cources in tributaries; sumption advisory downstream at Alamo Lake; ance of the fish consumption standard occurred ow when dissolved mercury could not be
MONITORING RECOMMEN	IDATIONS	tailings remediation actions	cury data to evaluate effectiveness of the mine s. eters to represent at least 3 seasons during an
			te heavy sediment transport. Recommend using bottom deposits implementation procedures in dopted.

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BUTTE CREEK	USE SUPPORT	OVERALL ASSESSMENT
15030202 163	A&Ww - Inconclusive FBC - Inconclusive FC - Inconclusive	Category 3
2.8 Miles	i C inconciasive	inconclusive



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MONITORING USE	D IN THIS A	ASSESSMENT		
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/10/2000 – 0 4-day mercury samples: 11/29-12/02/ 5/1-5/4/2006 NUMBER AND TYPES OF SAMPLES		05; 2/6-2/9/2006;
		Metals	Nutrients – Related	Other
Hillside Mine area tributary BWBUT000.59 103504	Phelps Dodge Ambient	5 total and 5-6 dissolved: Chromium 9 total and 10 dissolved: Mercury (grab	1 sample: Dissolved oxygen 12 pH	3 Turbidity
Above Boulder Creek BWBUT000.02 102081	ADEQ TMDL	samples) Four sets of 4-day mercury samples		
		4-8 total and 0-1 dissolved metals: Arsenic, beryllium, cadmium copper, lead, manganese, selenium, silver, zinc.		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury	0.6 μg/L FC	(03/05/2002 – 1.1 μg/L)	Attaining – No exceedances in 3 sampling events collected using more reliable monitoring and lab techniques.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	(03/21/2001 – 0.2 μg/L) (03/05/2002 – 1.1 μg/L)	Attaining – No exceedances in 3 sampling events. The more reliable monitoring and lab analysis data supersedes the previously collected data (shown in parenthesis).

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Insufficient dissolved metals (cadmium, copper, and zinc), and <i>E. coli</i> bacteria to assess A&Ww and FBC.		
MONITORING RECOMMENDATIONS		Low Priority Collect cor during an assessment perio	re parameters to represent at least 3 seasons od.

BUTTE CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Burro Creek 15030202 163 2.8 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/10/2000 – 0 4-day mercury samples: 11/29-12/02/ 5/1-5/4/2006 NUMBER AND TYPES OF SAMPLES		05; 2/6-2/9/2006
		Metals	Nutrients - Related	Other
Hillside Mine area tributary BWBUT000.59 103504	Phelps Dodge Ambient	5 total and 5-6 dissolved: Chromium 9 total and 10 dissolved: Mercury (grab	1 sample: Dissolved oxygen 12 pH	3 Turbidity
Above Boulder Creek BWBUT000.02 102081	ADEQ TMDL	samples) Four sets of 4-day mercury samples		
		4-8 total and 0-1 dissolved metals: Arsenic, beryllium, cadmium copper, lead, manganese, selenium, silver, zinc.		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury	0.6 μg/L FC	(03/05/2002 – 1.1 μg/L)	Attaining – No exceedances in 3 sampling events collected using more reliable monitoring and lab techniques.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	(03/21/2001 – 0.2 μg/L) (03/05/2002 – 1.1 μg/L)	Attaining – No exceedances in 3 sampling events. The more reliable monitoring and lab analysis data supersedes the previously collected data (shown in parenthesis).

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

			1
EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
Mercury	Insufficient dissolved metals (cadmium, copper, and zinc), and <i>E. coli</i> bacteria to assess A&Ww and FBC.		
MONITORING RECOMMEN	DATIONS	Low Priority Collect cor during an assessment perio	e parameters to represent at least 3 seasons od.

COORS LAKE 15030202 5000		USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
230 Acres	A D E Q	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3 Inconclusive		
	E P A	FC – Impaired (Affected use only)	Category 5	Mercury	EPA assessed as impaired in 2004 due to mercury In fish tissue

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 02/10/2000	0 – 07/13/2005	
DATABASE #		NUMBER AND TYPES OF SAMP	PLES	
		Metals	Nutrients - Related	Other
Mid lake BWCOO - B 102756	AGFD Ambient	1 total metal only: Cadmium, lead, nickel, and zinc.	I sample: Dissolved oxygen, pH, ammonia, nitrite/nitrate, nitrogen, total Kjeldahl nitrogen, and phosphate	1 Fluoride

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances in water chemistry			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient monitoring events	Lab detection limit for total mercury was higher than FC criterion.
MERCURY IMPAIRMENT DI	SCUSSION	Evidence of potential merc	ury impairment: on advisory issued in 2004 is still in effect.
			on davisory issued in 2004 is still in circuit
MONITORING RECOMMEN	IDATIONS		ury samples to support development of a TMDL
MONITORING RECOMMEN	IDATIONS	High Priority -Collect mere	

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COPPER BASIN WASH	USE SUPPORT	OVERALL ASSESSMENT
From headwaters to unnamed tributary at 342811 / 1123531 15030203 – 032A 4.6 Miles	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 03/03/2004		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Upper Copper Basin Wash BWCBW009.23 102323	ADEQ TDML	1 total and 1 dissolved: Mercury 1 total metals only: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, and zinc	None	None

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper	500 μg/L – AgL 1300 μg/L – FBC	03/03/2004 – 1720 μg/L	Inconclusive – Only 1 exceedance (binomial)
Lead	15 μg/L FBC	03/03/2004 – 20 μg/L	Inconclusive – Only 1 exceedance (binomial)
Selenium	2.0 µg/L A&Wc chronic	03/03/2004 – 5.0 μg/L	Inconclusive – Only 1 exceedance in the assessment period.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Copper, lead and selenium	Insufficient core parameters	Insufficient sampling events.	
MONITORING RECOMMENDATIONS		Medium Priority –Collect copper, lead, and selenium samples due t exceedances. Collect core parameters to represent at least 3 seasons during an assessment period.	
		,	nic criteria for mercury do not apply to this

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DATE CREEK	USE SUPPORT	OVERALL ASSESSMENT
	A&Ww - Attaining FBC - Attaining	Category 1
15030203 003 34.1 Miles	FC – Attaining AgL – Attaining	Attaining all uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/22/2002 – 05/26/04 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Date Creek Ranch BWDAT038.02 100529	ADEQ Ambient and TMDL	4-5 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 4 total and 0 dissolved: Boron, lead, manganese 6 total and 2 dissolved: mercury 1 total and 0-1 dissolved: Barium, nickel, selenium, silver	4-5 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	3 E. coli bacteria 5 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and 1 of 2 dissolved mercury samples were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	
9 - 9 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -			

FRANCIS CREEK	USE SUPPORT	OVERALL ASSESSMENT
From headwaters to Burro Creek 15030202 012 23.8 Miles	A&Ww - Attaining FBC - Attaining FC - Attaining DWS - Attaining Agi - Attaining AgL - Attaining	Category 1 Attaining all uses

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 10/21/2002 - 09/24/2003		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Spencer Creek BWFRA002.33 100556	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 4 total metals only: Boron, lead, manganese 6 total and 1 dissolved: mercury	4-5 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solid: 5 Suspended sediment concentration 5 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and 1 of 2 dissolved mercury samples were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower la mercury.	b detection limits for selenium and dissolved

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KIRKLAND CREEK	USE SUPPORT	OVERALL ASSESSMENT
	A&Ww – Attaining FBC – Inconclusive	Category 2
15030203 015 22.6 Miles	FC - Attaining Agl - Attaining	Attaining some uses

SITE NAMES ID#	AGENCY PURPOSE	SAMPLING PERIOD: 10/23/2003	2 – 06/25/2003			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients – Related	Other		
Near Ritter's Ranch BWKRK017.08 100408	ADEQ Ambient and TMDL	6 total and 2 dissolved: Mercury 4 total and dissolved metals:	4 samples: Ammonia, total nitrogen, total phosphorus,	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids		
At Yava Bridge BWKRK009.32 102320	ADEQ TMDL	Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc	nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and	5 Suspended sediment concentration 4 Turbidity		
		4 total metals only: Boron, lead, and manganese	pH			

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	10/23/2002 – 436 CFU/100 ml	Inconclusive – 1 exceedance during the last 3 years of monitoring.

DATA GAPS AND MO			DETECTION I I MITCHOT I ONL
EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
E. coli bacteria	Collected all core		Lab detection limits for selenium and 1 of 2
	parameters		dissolved mercury samples were higher than
	The state of the s		A&Ww chronic criteria.
MONITORING RECOMMEN	NDATIONS	Medium Priority – Collect	E. coli bacteria samples due to the exceedance.
		Use lower lab detection lin	nits for selenium and dissolved mercury.

KNIGHT CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Wheeler Wash to Big Sandy River 15030201 019 9.9 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

MONITORING U	SED IN THE	3 ASSESSIVIEIN I			
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING Dates: 09/19/2	004; 10/21/2004		
		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
Above Big Sandy River BWKN1000.53 102311	ADEQ TMDL	2 total only: Mercury	1 sample: Dissolved oxygen and pH	2 Suspended sediment concentration	

EXCEEDANCES	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury	0.6 μg/L FC	09/19/2004 – 1.94 μg/L 10/21/2004 – 0.96 μg/L	Inconclusive – Both samples collected exceeded standards. (Requires a minimum of 5 exceedances and 20 samples to determine impairment - Binomial)
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	09/19/2004 – 35,160 mg/L 10/21/2004 – 48,700 mg/L	Inconclusive – Both samples exceeded standards. Flow was measured for only one sample and it was 3.2 cfs. Field notes indicate the other was during high flow conditions of 9-10 cfs, so could not be used in the geometric mean calculation. Insufficient samples to calculate the geometric mean (requires a minimum of 4 samples.)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury and suspended sediment	Insufficient core parameters	Insufficient monitoring events	
MONITORING RECOMMEN	IDATIONS	samples due to exceedance support the development of relatively high levels in men from this drainage. Collect core parameters to period. The high SSC values indicate	nercury and suspended sediment concentration s. These mercury samples were collected to of TMDL for Alamo Lake (downstream). These recury indicate mercury loading may be coming represent at least 3 seasons during an assessment the heavy sediment transport. Recommend using bottom deposits implementation procedures in donted.

SANTA MARIA RIVER From Little Sycamore Creek to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Little Shipp Wash 15030203 013 6.8 Miles	A&Ww – Impaired FBC – Inconclusive FC – Attaining Agl – Inconclusive AgL – Inconclusive	Category 5	Mercury	Add to the 303(d) List (new 2006).

MONITORING	USED IN THI	S ASSESSMENT		
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/31/2003	- 01/05/2005	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Highway 96 BWSMR042.16 102318	ADEQ TDML	1 total metals only: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead,	2 Dissolved oxygen 6 pH	6 Suspended sediment concentration 4 Turbidity
Below Highway 96 BWSMR041.23 102319	ADEQ TMDL	manganese, mercury, nickel, selenium, silver, and zinc 5 total and 3 dissolved: Mercury		

EXCEEDANCE	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	07/31/2003 – 5.0 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water recharge.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	07/31/2003 – 0.017 μg/L 08/18/2004 – 0.022 μg/L	Impaired – 2 exceedances during the assessment period. Impairment decision supported by downstream impairment on Santa Maria River and at Alamo Lake, and ultra-clean field sampling techniques.
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	07/31/2003 - 209 mg/L 08/18/2004 - 1042 mg/L 09/19/2004 - 5084 mg/L 10/21/2004 - 480 mg/L 12/29/2004 - 8850 mg/L 01/05/2005 - 365 mg/L	Inconclusive – Exceeded 80 mg/L criterion in all 6 samples collected. High flow conditions were occurring during 4 of the sampling events (5084, 480, 8850, and 365 mg/L), so these values could not be included in the geometric mean calculation. Insufficient values were left to calculate a geometric mean, as a minimum of 4 samples are required.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	Insufficient dissolved metals (cadmium, copper, zinc), E. coli bacteria, boron, manganese, copper, and lead needed to assess A&Ww, FBC, Agl, and AgL		

MONITORING RECOMMENDATIONS	High Priority – Collect mercury samples to support TMDL development to evaluate effectiveness of TMDL implementation plans and remediation actions for Alamo Lake.
	Collect suspended sediment concentration samples due to exceedances. The high SSC values indicate heavy sediment transport. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.
	Collect core parameters to represent at least 3 seasons during an assessment period.

SANTA MARIA RIVER From Bridle Creek to Date Creek	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A&Ww – Impaired FBC – Attaining FC – Attaining Agl – Attaining Agl. – Attaining	Category 5	Mercury	Add to the 303(d) List (new 2006)

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 02/14/2000 – 05/17/2005 NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Below Highway 93 bridge BWSMR026.65 102306	ADEQ Ambient	34 total and 27 dissolved: Mercury 9-24 total and 6-24 dissolved metals:	22-34 samples: Ammonia, total nitrogen, total	23 <i>E. coli</i> bacteria 24 Fluoride 225 Total dissolved
At Highway 93 bridge BWSMR026.08 100399	ADEQ TMDL	Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, zinc	phosphorus, nitrite/nitrate, total Kjeldahl nitrogen, dissolved oxygen, and	solids 20 Suspended sediment concentration
		24 total metals only: Boron and manganese 1 Selenium	pH	31 Turbidity

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	09/18/2000 - 4.0 mg/L 09/12/2001 - 2.8 mg/L 07/31/2003 - 5.6 mg/L 09/16/2003 - 3.9 mg/L 09/29/2004 - 4.0 mg/L	Attaining – 4 of the low dissolved oxygen levels were due to natural conditions or low flow and ground water upwelling. Therefore, only 1 exceedance in 28 samples (binomial)
E. coli bacteria	235 CFU/100 ml FBC	05/08/2001 – 390 CFU/100 ml	Attaining –0 exceedances in the last 3 years of monitoring (17 samples since this one exceedance).
Mercury	0.6 μg/L FC	08/17/2004 – 0.63 μg/L	Attaining – Only 1 exceedance in 34 samples (binomial).
Mercury (dissolved)	0.01 µg/L A&Ww chronic	07/31/2003 – 0.019 μg/L 08/17/2004 – 0.011 μg/L (09/20/2004 – 0.012 μg/L#) 11/10/2004 – 0.011 μg/L	Impaired – 3 exceedances during the assessment period. #The sample on 09/20/2004 was collected during storm flows; therefore, ADEQ did not assume that it represented chronic conditions. Impairment decision was supported by upstream impairment on Santa Maria River and a downstream fish consumption advisory for mercury at Alamo Lake.
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	07/31/2003 – 322 mg/L 09/10/2003 – 866 mg/L 08/18/2004 – 9362 mg/L 09/19/2004 – 11,820 mg/L 10/21/2004 – 2410 mg/L 11/23/2004 – 850 mg/L 12/29/2004 – 9374 mg/L 02/24/2005 – 490 mg/L	Inconclusive – All exceedances occurred during high flows; therefore these values could not be used in the geometric mean calculation. Geometric mean of the remaining values did not exceed 80 mg/L

DATA GAPS AND MC EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	Collected all core parameters.	DISTRIBUTION	Lab detection limits for selenium and dissolved mercury were higher than A&W chronic criteria in at least 13 samples.
MONITORING RECOMMEN	DATIONS	High Priority – Collect mercury samples to support TMDL development to evaluate effectiveness of TMDL implementation plans and remediation actions a Alamo Lake.	
		indicate heavy sediment tran bottom deposits implementa	samples due to exceedances. The high SSC values sport. Recommend using biocriteria assessments and tion procedures in this reach, when they are eters to represent at least 3 seasons during an

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TROUT CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Cow Creek to Knight Creek	A&Ww - Attaining FBC - Inconclusive	Category 2	
15030201 014 32.1 Miles	FC – Attaining AgL – Attaining	Attaining some uses	

MONITORING L	IONITORING USED IN THIS ASSESSMENT				
SITE NAMES ID # DATABASE # AGENCY PURPOSE		SAMPLING PERIOD: 02/25/2000 – 09/28/2004			
		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above Divide Canyon BWTRT011.97 100670	ADEQ Ambient	8-21 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium,	20-23 samples: Ammonia, total nitrogen, total	20 <i>E. coli</i> bacteria 21 Fluoride 21 Total dissolved solids	
Near Wikieup BWTRT002.43 100397	ADEQ Ambient	copper, lead, nickel, silver, thallium, and zinc	phosphorus, nitrite/nitrate, total Kjeldahl nitrogen,	10 Suspended sediment concentration 23 Turbidity	
At Knight Creek BWTRT000.19 102309	ADEQ TDML	21 total metals only: Boron and manganese	dissolved oxygen, and pH		
		23 total and 16 dissolved: Mercury			

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&W/w	06/23/2003 – 5.4 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling and lack of riffle. Only 1 low DO in23 samples.
E. coli bacteria	235 CFU/100 ml FBC	02/23/2005 – 620 CFU/100 ml	Inconclusive – Only 1 exceedance. Note that the exceedance occurred during flood flow – 1978 cfs, while normal is 1-6 cfs.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	09/20/2004 – 0.039 μg/L	Inconclusive – Only 1 exceedance in the assessment period.
Suspended sediment concentration	Geometric mean 80 mg/L	09/20/2004 – 2031 mg/L	Attaining – Only 1 of 10 samples exceeded the 80 mg/L criterion. It occurred during a high flow event so would not be included in the geometric mean calculation. The remaining samples did not exceed the geometric mean standard.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
E. coli bacteria, mercury	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criterion in at least 11 samples.
MONITORING RECOMMENDATIONS		exceedances.	nercury and <i>E. coli</i> bacteria samples due to nits for selenium and dissolved mercury.
		The one high SSC value inc	dicates heavy sediment transport. Recommend

OVERALL ASSESSMENT	USE SUPPORT	WILDER CREEK
Category 3 Inconclusive	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	From headwaters to Boulder Creek 15030202 – 007 15.3 Miles

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/29/200	0 – 12/31/2001	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Boulder Creek BWWLD000.10 101014	ADEQ TMDL	8 total and dissolved metals: Arsenic, beryllium, copper, lead, manganese, and zinc	6 Dissolved oxygen and 7 pH	None

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient dissolved cadmium, <i>E. coli</i> bacteria, and mercury to assess the designated uses.		Lab detection limits for dissolved copper and lead were higher than chronic A&W standards in at least 4 samples each.
MONITORING RECOMMENDATIONS		Low Priority - Collect core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for dissolved lead and dissolved copper	

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Colorado - Grand Canyon Watershed

Watershed Description

This watershed is defined by the Colorado River drainage area, beginning in Arizona at Lake Powell, through the Grand Canyon National Park, to Hoover Dam at Lake Mead. It does not include the Little Colorado River drainage. The watershed contains spectacular incised canyons formed by erosion of sandstone formations, as well as volcanically formed mountains and high plateaus.

Land ownership is divided approximately as: 45% federal, 25% tribal, 15% private, and 5% state. Most of the 16,437 square miles in this watershed are sparsely populated, with an approximate population of 67,500 people (2000 census). The largest communities are Kingman and Williams. Land use is primarily open grazing, recreation, and silviculture (forestry), with scattered mining districts. The Grand Canyon National Park, Kaibab National Forest, Lake Mead National Recreation Area, and Glen Canyon National Recreation Area are all located within this watershed and all have restricted land uses to protect natural resources. These federal lands also draw a large number of tourists and recreationists.

Elevations range from 1,000 feet (above sea level) along the Colorado River to 10,400 feet near Flagstaff. The majority of the watershed is between 5,000-7,000 feet elevation, with high desert fauna and flora, including coldwater aquatic communities where perennial waters exist.

Water Resources

Precipitation varies from 10-15 inches a year, including about 1 inch of snowfall per year in higher elevations. Excluding the Colorado River and its reservoirs (Lake Powell and Lake Mead), surface water is sparse.

An estimate of surface water resources in the Colorado – Grand Canyon Watershed is provided in **Table X.** Waters on Indian lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Estimated Surface Water Resources in the Colorado - Grand Canvon Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	480	260	14,870
	Perennial	Non-perennial	
Lake acres	68,400	13,415	

Additional Estimated Water Resources on Indian Lands - Not Assessed

	Perennial	Intermittent	Ephemeral
Stream miles	125	5	3,740
	Perennial	Non-perennial	
Lake acres	390	0	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Map of watershed showing:
Generalized topography Highways Cities National Forests, Monuments, Refuges

Watershed Partnerships

Northwest Arizona Watershed Council
Their area is defined by three groundwater basins: Hualapai Valley (in the Colorado-Grand
Canyon Watershed), Sacramento Basin (in the Colorado-Lower Gila Watershed), and Big Sandy
(in the Bill Williams Basin). The council's goal is to protect and preserve water resources and
educate the public about water issues related to growth and development. The council meets on
the 3rd Wednesday of the month in Kingman, AZ. For information, contact Elmo Roundy (928)
757-2818 or Earl Engelhardt at (928) 692-1068 or imspirit@kingmanaz.net.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses – The following TMDL analyses are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL, if completed, can be obtained at ADEQ's website: www.azdeq.gov.

- The Colorado River near Diamond Creek is impaired due to suspended sediment (SSC) and selenium. The suspended sediment is at a concentration represents a risk aquatic coldwater communities. Selenium bioaccumulates and may pose a risk to aquatic life and wildlife that prey on aquatic life (such as birds). Investigations will need to determine source loadings, especially contributions from natural background in this sandstone dominated region and contributions from upstream states (Utah and Colorado). This TMDL is scheduled to be initiated in 2010.
- The Paria River and the Virgin River are impaired due to suspended sediments (SSC).
 Elevated suspended sediment concentrations represent a risk to aquatic communities. Further
 investigation is needed to determine source loading, especially contributions from natural
 background in this sandstone dominated region, and contributions from Utah. These TMDLs are
 scheduled to be initiated in 2010.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

- Composting Restrooms from Hualapai Reservation Project Hualapai Indian Tribe (2000 and 2002)
 Composting restrooms were constructed at three beaches used by rafters and campers along the Colorado River in the Grand Canyon National Park to minimize bacterial contamination to the river.
- The Greater Kingman Wildcat Dump Cleanup Project Northwest Arizona Watershed Council (2000)
 18 wildcat (illegal) dump sites in the Kingman areas were cleaned up to reduce potential surface and ground water contamination. The project also contained education and outreach to solicit community participation and minimize further dumping.
- Bank Stabilization of Spenser Beach to Protect Composting Restrooms Project Hualapai Tribal Nation (2006)
 Funds were used to stabilize eroding banks surrounding the composting restroom at Spencer Beach on the Colorado River in the Grand Canyon.
- Composting Restrooms at Helipad Project Hualapai Tribal Nation (2006)
 A composting restroom was constructed adjacent to a helipad landing area along the Colorado River in the Grand Canyon.

Chapter II – Colorado – Grand Canyon

CG - 3 Draft February 2007 Publication Number: EOR 07-02 Water Protection Fund Projects – The following Water Protection Fund Projects were awarded by the Arizona Department of Water Resources. For more information about these funds or projects can be obtained at ADWR's web site at http://www.azwater.gov.

- Invasive Vegetation In the Grand Canyon National Park Project Grand Canyon National Park Foundation (2006) Tamarisk and other invasive vegetation were removed at seeps, springs, and tributaries in the Grand Canyon National Park to improve water supplies and riparian conditions.
- Willow Creek Riparian Restoration Project Private land owner (2000) Riparian conditions along Willow Creek were restored to reduce sedimentation by replanting native plants, installing temporary irrigation for the new plants, and adding fencing to exclude grazing in the restored area.

Other Water Quality Studies - The following additional water quality related studies were completed since 2000 in this watershed:

- The Clean Colorado River Alliance Report (2006) Susan Craig, ADEQ, 2006 The Clean Colorado River Alliance Report, commissioned by Arizona Governor Janet Napolitano, identified several pollutants of particular concern for the lower Colorado River: nutrients, metals, endocrine disrupting compounds, perchlorate, bacteria and pathogens, salinity/total dissolved solids, and sediment. This report describes the impacts of these pollutants, discusses current mitigation efforts to address them, and sets forth a number of recommendations.
- A Monitoring Plan for the Occurrence of Hydrocarbon Constituents in Lake Powell, Mead, and Mohave, (in) Arizona, Nevada, and Utah National Park Service (2004) Monitoring is to evaluate the effects of long-term personal watercraft on water quality in large reservoirs.
- Variations In Sand Storage Measured at Monumented Cross Sections in the Colorado River Between Glen Canyon Dam and Lava Falls Rapid, Northern Arizona 1992-99 - Marilyn E. Flynn and Nancy J. Hornewer, U.S. Geological Survey (2003) USGS measured bed elevations in 131 cross sections to provide data on channel sand storage. Analyses of cross sections showed limited capacity to store sediment.
- Sediment Chemistry of the Colorado River Delta of Lake Powell, Utah, 2001 R.J. Hart, H.E. Taylor, R.C. Antweiler, D.D. Graham, G.G. Fisk, S.G. Riggins, and M.E. Flynn (2005) Sediment samples at the Colorado River delta of Lake Powell were analyzed to determine the amount of accumulation of various natural and human-introduced chemicals. Three cores and six sediment samples from sediment-water interface were collected near Hite marina where the delta is thickest. Concentrations were typical for delta sediments. Mercury concentrations ranged from 0.2 ng/g to 1,660 ng/g.
- Physical and Chemical Characteristics of Knowles, Forgotten, and Moqui Canyons, and Effects of Recreational Use on Water Quality, Lake Powell, Arizona and Utah - R.J. Hart, H.E. Taylor, R.C. Antweiler, G.G. Fisk, G.M. Anderson, D.A. Roth, M.E. Flynn, D.B. Peart, Margot Truini, and L.B. Barber (2004) This study documents the concentrations of trace elements, volatile organic compounds, organic wastewater contaminants (including E. coli bacteria), and other byproducts of fuel-based contaminants in water and bed material in Lake Lowell during the summers of 2001 and 2002.

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Human Health Pharmaceutical Compounds in Lake Mead, Nevada and Arizona, Las Vegas Wash, Nevada, October 2000 – August 2001 – Robert A. Boyd and Edward T. Furlong, U.S. Geological Survey, Open File Report 02-385 (2002)
 A reconnaissance study to investigate the occurrence of selected pharmaceutical compounds in water samples collected from Lake Mead on the Colorado River and Las Vegas Wash, a waterway used to transport treated wastewater form Las Vegas metropolitan area to Lake Mead. Thirteen of 33 targeted compounds were detected in at least one water sample. The most frequently detected compounds in the wash were caffeine, carbamazepine (used to treat epilepsy), cotinine (a metabolite of nicotine), and dehydronifedipine (a metabolite of antianginal Procardia).

Assessments

The Colorado – Grand Canyon Watershed can be separated into the following drainage areas in Arizona:

14070006	Lake Powell
14070007	Paria River
15010001	Marble Canyon
15010002	Grand Canyon
15010003	Kanab Creek
15010004	Havasu Creek
15010005	Lake Mead
15010006	Grand Wash
15010007	Red Lake
15010009	Fort Pearce Wash
15010010	Virgin River
15010014	Detrital Wash

These drainage areas and the surface waters assessed as "attaining" or "impaired" are illustrated on the following watershed map. Methods used to complete these assessments are described in the "Surface Water Assessment Methods and Technical Support" document (2006).

Assessment Map(s)	

BEAVER DAM WASH	USE SUPPORT	OVERALL ASSESSMENT	
9 6 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 09/22/2004 – 04/27/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Below Highway 91 bridge in Littlefield, AZ CGBDW001.19 100449	ADEQ Ambient	Ambient Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel,	4 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen,	4 E. coll bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment
Above Virgin River CGBDW000.10 100452	ADEQ Ambient	silver, thallium, and zinc 3-4 total metals only: Boron, chromium, & manganese	dissolved oxygen, pH	concentration 4 Turbidity

EXCEEDANCES	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	02/02/2005 – 6143 CFU/100 ml 04/27/2005 – 270 CFU/100 ml	Inconclusive – Although 2 exceedances occurred in the last 3 years of monitoring, only 1 of them was above the screening value of 300 CFU/100 ml. One exceedance (270 CFU) occurred during flood flow. ADEQ will continue to collect samples rather than list at this time.
Lead	15 μg/L FBC	02/02/2005 – 20 μg/L	Inconclusive -1 of 4 samples exceeded criterion.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	02/02/2005 – 500 mg/L 04/27/2005 – 1920 mg/L	Inconclusive – 2 of 4 samples exceeded the 80 mg/L criterion. One value was during a high flow event (1920 mg/L), so could not be used to calculate the geometric mean. Insufficient samples left to calculate two geometric means for assessment.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead, E. coll bacteria, and SSC	All core parameters were collected		Lab detection limits for selenium and 3 dissolved mercury samples were above the A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		sediment samples due to e concentration indicates se assessments and bottom d when they are adopted.	additional lead, <i>E. coli</i> bacteria, and suspended exceedances. The high suspended sediment diment transport. Recommend using biocriteria leposits implementation procedures in this reach, mits for selenium and dissolved mercury.

BRIGHT ANGEL CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Phantom Creek to Colorado River 15010001 019 1.9 Miles	A&Ww - Inconclusive FBC - Attaining FC - Attaining	Category 2 Attaining some uses	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 01/07/2003 – 05/04/2005		
DATABASE #		NUMBER AND TYPES OF SAME	PLES	
		Metals	Nutrients - Related	Other
Above Phantom Ranch CGBRA001.36 100423	ADEQ Ambient	3-5 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead,	5-6sample: Ammonia, total nitrogen, total phosphorus, total	5 E. coli bacteria 5 Fluoride 6 Total dissolved solid:
Below Phantom Ranch CGBRA000.44	ADEQ Ambient	mercury, and zinc	Kjeldahl nitrogen, dissolved oxygen, pH	5 Suspended sediment concentration
100422		4-5 total metals only: Boron, chromium, and manganese		6 Turbidity

EXCEEDANCE:			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	05/03/2005 – 168 mg/L	Inconclusive – The elevated SSC occurred during a high flow event so could not be used in the Geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional suspended sediment concentration samples due to the exceedances. Recommend using biocriteria assessmen and bottom deposits implementation procedures in this reach, when the are adopted.	
		Use a lower lab detection	limit for selenium.

CATARACT LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15010004 – 0280 35 Acres	A&Wc – Inconclusive FBC – Inconclusive	Category 3	
	FC – Inconclusive DWS – Inconclusive AgL – Inconclusive	Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 08/14/2003		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
At dam CGCAT - A 100015	ADEQ Ambient	1 total and dissolved metals: Chromium, nickel, silver, zinc. 1 total metal only: Antimony, arsenic, barium, beryllium, boron, cadmium, copper, lead, mercury, selenium, and thallium.	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Total dissolved solids 1 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Ammonia	0.40 mg/L at pH 8.8 SU and temperature 22.8 C A&Wc chronic	08/14/2003 – 0.44 mg/L at 1 meter	Inconclusive – Only 1 exceedance.
Manganese	980 μg/L DWS	08/14/2003 – 3830 μg/L	Inconclusive – Only 1 exceedance.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Ammonia and manganese	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for cadmium, copper, and lead above the A&Ww chronic criteria.
MONITORING RECOMMEN	DATIONS	exceedances. High ammoloadings. New methods for should be applied to this narrative nutrient violation. Collect core parameters to assessment period.	ammonia and manganese samples due to the nia levels may be a symptom of excess nutrient or implementing the narrative nutrient standard lake once adopted, to determine whether ons are occurring. To represent at least 3 seasons during an alimit for cadmium, copper, and lead.

CLEAR CREEK	USE SUPPORT	OVERALL ASSESSMENT
From unnamed tributary at 360912 / 1115825 to Colorado River 15010001 – 0258 8.1 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/22/2004 – 05/03/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above Colorado River CGCLE000.19 101964	ADEQ Ambient	3-4 total and dissolved metals: Antimony, arsenic, barlum, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity	

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMEN	IDATIONS	Low Priority –Use a lower	r lab detection limit for selenium.

COLORADO RIVER From Lake Powell to Paria River	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
14070006 001 16.3 Miles	A&Wc – Impaired FBC – Attaining FC – Attaining DWS – Attaining AgI – Attaining AgL – Attaining	Category 5	Selenium	Add selenium to the 303(d) List

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/26/2000 – 09/07/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At Lees Ferry, AZ USGS #09380000 CGCLR698.93 100743	USGS Ambient	17-20 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	19-22 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	20 E. coli bacteria 22 Fluoride 22 Total dissolved solids 21 Suspended sediment concentration 22 Turbidity 5 Pesticides		

EXCEEDANC	F2		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	11/13/2002 - 6.5 mg/L 02/04/2003 - 6.3 mg/L	Attaining – Only 2 of 21 samples showed low dissolved oxygen.
Selenium	2.0 µg/L A&Wc chronic	02/04/2003 – 3.0 μg/L 09/07/2004 – 2.4 μg/L	Impaired – 2 exceedances during the assessment period. Impairment decision supported by downstream reaches that are also listed as impaired due to selenium.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for dissolved mercury was above the A&Wc chronic criterion
MONITORING RECOMMENDATIONS		High Priority – Collect selenium samples to support development of the TMDL Coordinate TMDL development with other selenium TMDLs in the region. Use a lower lab detection limit for dissolved mercury.	

COLORADO RIVER From Parashant Canyon to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Diamond Creek 15010002 – 003 27.6 Miles	A&Wc - Impaired FBC - Inconclusive FC - Inconclusive DWS - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 5	Selenium and suspended sediment	Added sediment and selenium in 2004.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/20/2000	0 – 01/13/2005	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Diamond Creek USGS #09404200 CGCLR473.00 101483	USGS and ADEQ Ambient	0-1 total and 32-28 dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, manganese, selenium, silver, uranium, and zinc 1 total metal only: Mercury	38-40 sample: total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH 0 Ammonia and nitrite/nitrate	1 Fluoride 1 Total dissolved solids 39 Suspended sediment concentration 12 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended Sediment Concentration	Geometric mean 80 mg/L A&Wc	Too many to list here. Exceedances varied from 88 to 1730 mg/L	Remains impaired – Exceeded 80 mg/L in 23 of 39 samples. Flow is regulated by upstream dam releases but one result appeared to be during a high flow. Using the remaining data, the geometric mean (of at least 4 consecutive samples) exceeded the standard several times.
Selenium	2 µg/L A&Wc chronic	Too many to list here. All exceedances were only slightly over the standard, ranging from 2.1 to 3.8 µg/L	Remains impaired – Exceeded criterion 21 times during the assessment period.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient total metals (arsenic, lead, chromium, mercury, boron, manganese, and copper), fluoride, and <i>E. coli</i> bacteria to assess A&W, FBC, DWS, FC, AgI, and AgL		Lab detection limit for selenium was above the A&W/w chronic criterion	
MONITORING RECOMMENDATIONS		High Priority -Collect samples to support development of suspended sediment and selenium TMDLs.		
		Collect missing core parar during the assessment per		

CRYSTAL CREEK	USE SUPPORT	OVERALL ASSESSMENT
The state of the s	A&Ww – Attaining FBC – Inconclusive FC – Attaining	Category 2 Attaining some uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/22/2004 – 05/03/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #	ADEQ Ambient			
		Metals	Nutrients - Related	Other
Above Colorado River CGCRY000.05 100525		4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron,	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solid: 4 Suspended sediment concentration 4 Turbidity
		chromium, manganese		4 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L FBC	07/24/2004 – 120 μg/L	Inconclusive – 1 exceedance in 4 samples. Note the relatively high magnitude of the exceedance.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Arsenic	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMEN	DATIONS	Medium Priority –Collect Use a lower lab detection	arsenic samples due to the exceedance. limit for selenium.

DEER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From unnamed tributary at 362616 / 1122815 to Colorado River 15010002 - 019B 4.9 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/08/2003 - 05/07/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Colorado River CGDEE000.07 100532	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 E. coli bacteria 4 Fluoride 4 Total dissolved solid: 4 Suspended sediment concentration 5 Turbidity

	AMERICAN A DEP	DATE	DECIGNATION LICE CHICAGO
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Lead	15 μg/L FBC	07/26/2004 – 38.3 μg/L	Inconclusive – 1 of 4 samples exceeded.
Selenium	2.0 µg/L A&W/w chronic	07/26/2004 – 10 μg/L	Inconclusive – Only 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	07/27/2004 – 20,002 mg/L	Inconclusive – The exceedance occurred during a flash flood event, so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead, selenium, suspended sediment All core parameters were collected			Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority -Collect more lead, suspended sediment and selenium samples due to exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when the are adopted.	
		Use a lower lab detection	limit for selenium.

DOGTOWN RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT	
15010004 0580 70 Acres	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining DWS - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 06/20/2001 -	03/19/2002		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At Dam CGDOG - A 100019	ADEQ Ambient	4 total metals only: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel selenium, silver, and zinc	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 4 Total dissolved solid 4 Turbidity	

EXCEEDANC			DEGICALIZED LIST CLIDDODT
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	09/05/2001 – 6.6 mg/L	Inconclusive – Only 1 of 4 samples did not meet standards
pН	<9.0 SU A&Wc, FBC, DWS, AgI, AgL	06/20/2001 – 9.3 SU	Inconclusive – Only 1 of 4 samples did not meet standards
Selenium	2.0 µg/L A&Wc chronic	03/19/2002 – 3.0 μg/L	Inconclusive – Only 1 exceedance during the assessment period.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen, pH, and selenium	Insufficient dissolved metals (cadmium, copper, zinc) and <i>E. coli</i> bacteria to assess A&Wc and FBC.		
A&Wc and FBC. MONITORING RECOMMENDATIONS		due to the exceedances. Collect core parameters to assessment period. The old turbidity standard and 75 NTU). Turbidity, I symptoms of excess nutrien narrative nutrient standard	dissolved oxygen, pH, and selenium samples or represent at least 3 seasons during an discovery of the seasons during an an elementary of the seasons during an arrangement of the seasons during an elementary of the seasons during an elementary of the seasons during the discovery of the seasons during an elementary of the seasons during t

HAVASU CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Havasupi Indian Reservation to Colorado River 15010004 – 001 3.3 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/09/2003 – 05/10/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
Above Colorado River USGS #09404115 CGHAV000.36 100568	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 5 Suspended sediment concentration 5 Turbidity

EXCEEDANC	.E3		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium.	

HERMIT CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Hermit Pack Trail crossing to Colorado River 15010002 – 020B 3.5 Miles	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/24/200	4 – 05/05/2005	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Colorado River CGHRM000.08 100570	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese 1 Selenium	4 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen 5 Dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Ww chronic	03/05/2005 – 5.4	Inconclusive – Only 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority -Collect a lower lab detection limi	more selenium samples due to exceedance. Use t for selenium.

KAIBAB LAKE	USE SUPPORT	OVERALL ASSESSMENT
15010004 - 0710 60 Acres	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive DWS - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 3 Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 08/14/2003			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At dam CGKAI - A 100027	ADEQ Ambient	1 total and dissolved metals: Cadmium, chromium, copper, lead, nickel, silver, zinc. 1 total metal only: Antimony, arsenic, barium, beryllium, boron, mercury, selenium, and thallium.	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Total dissolved solids 1 Turbidity	

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	
MONITORING RECOMMEN	DATIONS	Low Priority -Collect core during an assessment perior	e parameters to represent at least 3 seasons od.

KANAB CREEK	USE SUPPORT	OVERALL ASSESSMENT	
Colorado River 15010003 – 001	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining DWS – Inconclusive AgI – Attaining AgL – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/09/200	3 – 05/09/2005	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Colorado River CGKAN000.26 100577	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCE	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Lead	15 µg/L FBC and DWS	07/28/2004 – 28 μg/L	Inconclusive – 1 of 4 samples exceeded the criterion.
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	07/24/2004 – 1484 mg/L 03/07/2005 – 153 mg/L	Inconclusive – Geometric mean of all 4 SSC samples was 128, which exceeds the 80 mg/L standard. However, a minimum of 2 exceedances of the geometric mean is required to determine impairmen

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead and suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMEN	IDATIONS	concentration samples du	more lead and suspended sediment e to exceedances. Recommend using biocriteria leposits implementation procedures in this reach, limit for selenium.

LAKE POWELL	USE SUPPORT	OVERALL ASSESSMENT	
14070006 - 1130 9770 Acres (In Arizona)	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive DWS - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/32/2004 – 04/14/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients – Related	Other		
Antelope Marina – 102956 Blue Notch – 103011 Bullfrog Marina – 102983 Dangling Rope Marina – 102978 Escalante Creek – 102980 Farley Canyon – 103012 Forgotten 5 – 102984 Halls Crossing Marina – 102981 Knowles 3 – 102985 Lone Rock Beach – 102974 Moqui 4 – 102982 Padre Bay – 102975 Rainbow Bridge – 102977 San Juan River – 102979 State Line – 102973 Wahweep Marina – 102972 Warm Creek Bay - 102976	USGS Special study	None	None	17 Petroleum products 17 Chlorinated hydrocarbons and other VOCs		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	INITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Missing core parameters		
MONITORING RECOMMEN	DATIONS	Low Priority -Collect suffi seasons during an assessm	licient core parameters to represent at least 3 ent period.

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MATKATAMIBA CREEK	USE SUPPORT	OVERALL ASSESSMENT	
I Tolli licadivately to colorado	A&Ww - Attaining FBC - Attaining FC - Attaining	Category 1 Attaining All Uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/28/2004 – 05/09/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Colorado River CGMAT000.03 100591	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Ww chronic	01/10/2005 – 5.6 μg/L 03/07/2005 – 6.7 μg/L 05/09/2005 – 6.1 μg/L	Attaining – Selenium contamination is entirely due to natural sources in this remote and small drainage in the Grand Canyon National Monument.

DATA GAPS AND MC	NITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion	
MONITORING RECOMMENDATIONS		Low Priority - Use a lower lab detection limit for selenium.		

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MONUMENT CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Colorado River 15010002 – 845 3.5 Miles	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining Ali Uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/07/2003 – 05/05/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Colorado River CGMON000.19 101434	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese 2 total metals only: Selenium	4-5sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 5 Total dissolved solid. 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 µg/L A&Ww chronic	03/04/2005 – 0.13 μg/L	Inconclusive – Only 1 exceedance during the assessment period.
Selenium	2.0 μg/L A&Ww chronic	03/04/2005 – 5.5 μg/L 05/05/2005 – 6.7 μg/L	Attaining – Selenium contamination is entirely due to natural sources in this remote and very small drainage in the Grand Canyon National Monument.
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	01/07/2005 – 135 mg/L	Attaining – The criterion (80 mg/L) was exceeded, but the geometric mean of all 4 samples did not exceed the standard.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority -Collect additional mercury samples due to the exceedance. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	

NANKOWEAP CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From unnamed tributary at 361530 / 1115723 to Colorado River 15010001 – 033B 7.3 Miles	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/05/200	03 – 05/02/2005	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Colorado River CGNAN000.20 100594	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	01/05/2005 – 932 mg/L	Inconclusive – The elevated SSC occurred soon after a high flow event so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMEN	IDATIONS	samples due to the exceed	additional suspended sediment concentration dances. Recommend using biocriteria assessments lementation procedures in this reach, when they

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PARIA RIVER From Utah Border to Colorado	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
River 14070007 123 29.4 Miles	A&Ww – Impaired FBC – Impaired FC – AttainIng	Category 5	Suspended sediment and E. coli bacteria	Add E. coli bacteria. Added suspended sediment in 2004.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 04/14/2000 – 04/26/2005 NUMBER AND TYPES OF SAMPLES			
DATABASE #					
		Metals	Nutrients - Related	Other	
At mile 7.5 CGPAR021.57 101076	ADEQ TMDL	4-9 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, thailium, and zinc 4-9 total metals only: Boron, manganese, mercury 1 total metals only: Selenium	4-6 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 9 Fluoride 4 Total dissolved solids 30 Suspended sediment concentration 9 Turbidity	
Mile 15 CGPAR014.25 101075	ADEQ TMDL				
Mile 22.5 CGPAR008.41 101074	ADEQ TMDL				
Above Colorado River CGPAR001.62 100617	ADEQ Ambient				
At Lees Ferry USGS #09382000 CGPAR001.23 101447	USGS Special Study (SSC)				
At Lees Ferry CGPA000.49 101073	ADEQ TMDL				

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	07/20/2004 – 2250 CFU/100 ml 01/31/2005 – 317 CFU/100 ml 04/26/2005 – 250 CFU/100 ml	Impaired – 3 exceedances during the assessment period. Two were above the screening value of 300 CFU/100 ml.
Lead	15 µg/L FBC	07/20/2004 – 75 μg/L 11/08/2004 – 49 μg/L 01/31/2005 – 66 μg/L	Inconclusive –3 exceedances in 6 samples. (Requires a minimum of 5 exceedances in 20 samples to determine impairment.)
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	Too many exceedances to list here. Results varied from 53 to 70,400 mg/L11 results were above 10,000 mg/L.	Remains impaired – 20 of 30 samples exceeded the 80 mg/L criterion. Only one result was during high flows. Geometric mean was exceeded repeatedly.
Selenium	2.0 μg/L A&W/w chronic	04/26/2005 – 14 μg/L	Inconclusive – 1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

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EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Lead and selenium All core parameters were collected			Lab detection limit for selenium was above the A&Wc chronic criterion	
MONITORING RECOMMENDATIONS		concentration samples to biocriteria assessments and this reach, when they are	m and lead samples due to the exceedances.	

ROYAL ARCH CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Colorado River 15010002 – 871 5.1 Miles	A&WW - Attaining FBC - Attaining FC - Attaining	Category 1 Attaining all uses	3

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 01/08/2003 – 05/06/2005		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Above Colorado River CGRYA000.05 100632	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 μg/L A&Ww chronic	07/25/2004 – 5.1 μg/L 05/06/2005 – 6.0 μg/L	Attaining – Selenium contamination is entirely due to natural sources in this remote and small drainage in the Grand Canyon National Monument.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	DNITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium.	

SANTA FE RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT
15010004 - 1340 12 Acres	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive	Category 3 Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 08/14/2003			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At dam CGSAT - A 100083	ADEQ Ambient	1 total and dissolved metals: Chromium, copper, nickel, zinc. 1 total metal only: Antimony, arsenic, barium, beryllium, boron, cadmium, lead, mercury, selenium, silver	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Total dissolved solid 1 Turbidity	

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	6.9 µg/L at 49 mg/L hardness A&Wc chronic	08/14/2003 – 10 μg/L	Inconclusive – Only 1 exceedance during the assessment period.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Copper	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for dissolved metals (cadmium, lead, and silver) and thallium were above the A&WW chronic criteria.
MONITORING RECOMMENDATIONS		Collect core parameters to assessment period. Use a lower lab detection The old turbidity standard standard (9.05 SU), althor Turbidity and high pH ma methods for implementing	copper samples due to the exceedance. o represent at least 3 seasons during an limit for dissolved metals and thallium. d (10 NTU) was exceeded and pH was at the ugh it did not technically exceed the standard ugh be symptoms of nutrient loading. New g the narrative nutrient standard should be adopted, to determine whether narrative

SHINUMO CREEK	USE SUPPORT	OVERALL ASSESSMENT
From unnamed tributary at 361821 / 1121803 to Colorado River 15010002 – 029B 8.8 Miles	A&Ww – Inconclusive FBC – Attaining FC – Attaining	Category 2 Attaining some uses

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 07/25/2004 – 05/06/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Colorado River CGSHI000.05 100532	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration	Geometric mean 80 mg/L A&Ww	05/06/2005 – 500 mg/L	Inconclusive – The exceedance occurred during a hig flow event, so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means for the assessment.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority -Collect more suspended sediment samples due to exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted Use a lower lab detection limit for selenium.	

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SPRING CANYON CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Colorado River 15010002 – 318 6.0 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/10/2003 – 05/11/2005				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Above Colorado River CGSPG000.17 100648	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 5 Suspended sediment concentration 4 Turbidity		

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium.	

TAPEATS CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Colorado River 15010002 – 696 12.8 Miles	A&Wc - Inconclusive FBC - Attaining FC - Attaining	Category 2 Attaining some uses	

MONITORING L SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/26/200				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Above Colorado River CGTAP000.08 100662	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, mercury, and zinc 4 total metals only: Boron, chromium, manganese	4-5 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	05/07/2005 – 110 mg/L	Inconclusive – The exceedance occurred during a flash flood event, so could not be used in the geometric mean calculation. Insufficient samples left to calculate two geometric means and determine impairment.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Suspended sediment concentration	All core parameters were collected		Lab detection limit for selenium was above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority -Collect addition SSC data due to exceedance. Use a lower lab detection limit for selenium.	

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VIRGIN RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Black Rock Gulch to Sullivan's Canyon 15010010 006 10.3 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Attaining Agl – Attaining AgL – Attaining	Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 09/21/2004 - 04/27/2		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
At I-15 rest stop CGVGR052.23 100679	ADEQ Ambient	3-4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, copper, lead, nickel, selenium, silver, thallium, and zinc 3-4 total and 0-1 dissolved: Boron, chromium, manganese, mercury 1 total metals only: Selenium	4 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	09/21/2004 – 720 CFU/100 ml 11/09/2004 – 383 CFU/100 ml	Inconclusive – 2 exceedances during the last 3 years of monitoring; however, one occurred during high flows when bacteria are naturally elevated. More monitoring is needed to determine whether impairment is occurring.
Lead	15 μg/L FBC	11/09/2004 – 89 μg/L	Inconclusive –1 of 4 samples exceeded criterion.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&W/w	09/21/2004 – 930 mg/L 11/09/2004 – 5383 mg/L 02/01/2005 – 330 mg/L 04/27/2005 – 2700 mg/L	Inconclusive – All 4 samples exceeded the 80 mg/L criterion. One value was during a high flow event (2700 mg/L), so could not be used to calculate the geometric mean. Insufficient samples left to calculate two geometric means and determine impairment.
Selenium	2.0 µg/L A&Ww chronic	11/09/2004 – 19.0 μg/L	Inconclusive—1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MON	NITORING NEEDS	5	
	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
The state of the s	All core parameters were collected		Lab detection limits for selenium and dissolved mercury were above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority – Collect E. coli bacteria, lead, SSC, and selenium samples due to exceedances. Use lower lab detection limits for selenium and dissolved mercury.	

VIRGIN RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Sullivan's Canyon to Beaver Dam Wash 15010010 004 9.7 Miles	A&Ww - Inconclusive FBC - Inconclusive FC - Attaining AgI - Attaining AgL Attaining	Category 2 Attaining some uses	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 09/22/2004 – 04/27/2005		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
At Littlefield, AZ CGVGR039.41 100680	ADEQ Ambient	3-4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc 3-4 total and 0-1 dissolved: Boron, manganese, mercury 1 total metals only: Selenium	4 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES		T = 1 = 2	
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	11/10/2004 – 367 CFU/100 ml 04/27/2005 – 300 CFU/100 ml	Inconclusive – Although 2 exceedances in the last 3 years of monitoring, only 1 of them was above the screening value of 300 CFU/100 ml (other is at the screening value). ADEQ will continue to collect samples rather than list at this time.
Lead	15 μg/L FBC	11/10/2004 – 35 μg/L	Inconclusive –1 of 4 samples exceeded criterion.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	09/22/2004 - 302 mg/L 11/10/2004 - 2900 mg/L 02/01/2005 - 313 mg/L 04/27/2005 - 4500 mg/L	Inconclusive— All 4 samples exceeded the 80 mg/L criterion. One value was during a high flow event (4500 mg/L), so would not be used to calculate the geometric mean. Insufficient samples left to calculate two geometric means and determine impairment.
Selenium	2.0 µg/L A&Ww chronic	11/10/2004 – 7.2 μg/L	Inconclusive—1 exceedance during the assessment period. Lab detection limits for all other samples were higher than A&W chronic criterion, so could not be used to determine attainment.

DATA GAPS AND MC			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead, <i>E. coli</i> bacteria, suspended sediment, and selenium	All core parameters were collected		Lab detection limits for selenium and dissolved mercury were above the A&Ww chronic criterion
MONITORING RECOMMENDATIONS		Medium Priority -Collect additional lead, <i>E. coli</i> bacteria, SSC, and selenium samples due to exceedances. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted.	
		Use lower lab detection lin	nits for selenium and dissolved mercury.

VIRGIN RIVER From Beaver Dam Wash to Big	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Bend Wash 15010010 003 10.1 Miles	A&Ww – Impaired FBC – Inconclusive FC – Attaining Agl – Inconclusive Agl. – Inconclusive	Category 5	Suspended sediment and selenium	Added suspended sediment and selenium in 2004.

SITE NAMES	AGENCY	SAMPLING PERIOD: 01/06/2000 – 08/09/2004			
ID#	PURPOSE	NUMBER AND TYPES OF S			
DATABASE #		Metals	Nutrients - Related	Other	
At Littlefield, AZ USGS #09415000 CGVGR010.18 (not in ADEQ's database)	USGS Ambient	22 dissolved metals only: Arsenic, boron, selenium	23-25 samples: Ammonia, total phosphorus, nitrate/nitrite, dissolved oxygen, pH	16 <i>E. coli</i> bacteria 22 Fluoride 22 Suspended sediment concentration 18 Turbidity	

EXCEEDANCES	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Boron	1000 μg/L AgI	08/22/2000 – 1020 μg/L	Inconclusive – Only 1 exceedance. Samples were only the dissolved portion. Need total boron samples.
E. coli bacteria	235 CFU/100 ml FBC	03/26/2003 520 CFU/100 ml	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.
Suspended Sediment Concentration (SSC)	Geometric mean 80 mg/L A&Ww	Too many to list here. Exceedances ranged from 83 to 5030 mg/L.	Remains impaired – 17 of 22 samples exceeded the standard. Geometric mean of 4 consecutive samples exceeded the 80 mg/L standard repeatedly.
Selenium	2.0 µg/L A&W/w chronic	08/29/2001 – 2.2 µg/L 05/20/2002 – 2.8 µg/L 08/27/2002 – 2.8 µg/L 02/26/2003 – 2.7 µg/L 05/27/2003 – 2.6 µg/L 03/02/2004 – 2.4 µg/L 06/15/2004 – 2.4 µg/L 08/09/2004 – 2.9 µg/L	Remains impaired – 8 exceedances during the assessment period.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Boron and <i>E. coli</i> bacteria	Insufficient dissolved metals (cadmium, copper, zinc), mercury, boron, manganese, copper, and lead		
MONITORING RECOMMENDATIONS		High Priority – Collect samples to support development of selenium and suspended sediment concentration TMDLs. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted. Collect additional boron and <i>E. coli</i> bacteria samples due to exceedances. Collect core parameters to represent at least 3 seasons during the assessment period.	

Colorado - Lower Gila

Colorado – Lower Gila Watershed

Watershed Description

This watershed is defined by the Colorado River drainage area, from Hoover Dam at Lake Mead to the Mexico border near Yuma. It does not include the Bill Williams River drainage or the Gila River above Painted Rocks Dam.

Land ownership is divided approximately as: 89% federal, 6% state, 4% tribal, and 1% private. Except for communities along the Colorado River (e.g., Yuma, Bullhead City, Lake Havasu City, Kingman), most of this 14,459 square mile watershed is sparsely populated with only 187,700 people (2000 census).

Due in part to the sparse population, six wildlife refuges and three wilderness areas have been established in this watershed, along with several military bases with live fire exercise areas. All of these have restricted land uses. Tribal and private land is primarily along the Colorado River and lower Gila River and is intensively cultivated. Open grazing occurs across the watershed.

Elevations range from 5,450 feet (above sea level) in the mountains near Lake Mohave to 80 feet along the Colorado River as it flows into Mexico. The area contains low desert fauna and flora, and support warmwater aquatic communities where perennial waters exist.

Water Resources

Precipitation is meager, varying from 3 to 10 inches a year. Perennial water is limited to the Colorado River mainstem and its reservoirs, with irrigation return flow providing perennial flow in the Gila River near Yuma.

An estimate of surface water resources in the Colorado – Lower Gila Watershed is provided in **Table X.** Waters on Indian lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Table X. Estimated Surface Water Resources in the Colorado - Grand - Lower Gila Watershed

Excluding Indian Lands

	Perennial	Intermittent	Ephemeral
Stream miles	375	145	13,545
	Perennial	Non-perennial	
Lake acres	36,860	0	

On Indian Lands - Not Assessed

	Perennial	Intermittent	Ephemeral
Stream miles	75	0	535
	Perennial	Non-perennial	
Lake acres	245	0	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Map of watershed showing:

Generalized topography
Highways
Cities
National Forests, Monuments, Refuges
HUCs (the subdivisions by number)

Watershed Partnerships

• Northwest Arizona Watershed Council Their area is defined by three groundwater basins: Hualapai Valley (in the Colorado-Grand Canyon Watershed), Sacramento Basin (in the Colorado-Lower Gila Watershed), and Big Sandy (in the Bill Williams Basin). The council's goal is to protect and preserve water resources and educate the public about water issues related to growth and development. The council meets on the 3rd Wednesday of the month in Kingman, AZ. For information, contact Elmo Roundy (928) 757-2818 or Earl Engelhardt at (928) 692-1068 or imspirit@kingmanaz.net.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses – The following TMDL analyses are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL if completed can be obtained at ADEQ's website: www.azdeq.gov

- The Colorado River below Hoover Dam is impaired by selenium.
 Selenium bioaccumulates and may pose a risk to aquatic life and wildlife that prey on aquatic life (e.g., some birds). Long term monitoring below Hoover Dam will help support TMDL development. Investigations are needed to determine source loadings, especially contributions from natural background and other states (Nevada, Utah, Colorado, and upper Colorado Basin states). The TMDL is scheduled to be initiated in 2009.
- Gila River near Dome is impaired due to boron and selenium.
 Elevated boron can be toxic to plant growth. Selenium bioaccumulates and may pose risks to aquatic life and wildlife that prey on aquatic life. Elevated selenium and boron may be associated with the extensive irrigated agriculture in this area near Yuma. These TMDLs may be complex due to the large number of potential sources, seasonal influences, and natural background considerations.
- Painted Rocks Borrow Pit is impaired due to pesticides contamination in fish and low dissolved oxygen. This lake was closed to the public for recreational uses, including fishing, after a fish consumption advisory was issued due to pesticides in fish tissue (DDT metabolites, toxaphene, and dieldrin). The pesticide TMDLs for this lake will be developed in association with the ones for several reaches of the Gila River and Painted Rock Reservoir (see TMDL discussion in the Middle Gila Watershed). It is scheduled to be initiated in 2009.

A 1992 diagnostic feasibility study by ADEQ indicated that the low dissolved oxygen in the lake was due to the design and maintenance of this shallow lake. During the past several years, the lake has been dry or at best a mud hole, and further representative samples could not be collected. A TMDL will be initiated when there is sufficient water in the lake.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

The Greater Kingman Wildcat Dump Cleanup Project
Northwest Arizona Watershed Council (2000)
Clean up of 18 wildcat waste dump sites in the Kingman areas to reduce potential surface and ground water contamination. The project also provided education and outreach to solicit community participation and minimize further dumping.

Water Protection Fund Projects - The following Water Protection Fund Projects have been awarded by the Arizona Department of Water Resources. More information about these funds or projects can be obtained from the ADWR web site at: http://www.azwater.gov.

Colorado River Indian Tribes 30 Acre Riparian Revegetation Project

The Colorado River Indian Tribes (2000)

Restore 30 acres of riparian area in the Ahakhav Tribal Preserve on Deer Island. This would complement the 75 other acres restored in 1997.

Yuma East Wetlands Riparian Revegetation Project

The City of Yuma (2004)

Restore 25 acres of critical riparian habitat along the Colorado River near Yuma.

Yuma East Wetlands Restoration Project

Quechan Indian Nation (2005)

Restore 25 acres of riparian area, 20 acres of river channel, and 10 acres of wetand habitat.

Other Water Quality Studies

Water Issues of the Arizona - Mexico Border: The Santa Cruz, San Pedro, and Colorado Rivers.

Terry W. Sprouse, University of Arizona, Water Resources Research Center (2005)

Summary of water quality and water quantity issues facing this region.

Yuma East Wetlands Restoration Plan

The Yuma East Wetlands includes 1,100 acres of riparian habitat, 148 acres of open water, 98 acres of marshland, and 20 acres of agricultural land along the Colorado River, between the Gila River and the Ocean-to-Ocean Bridge in Yuma. The plan is to restore native riparian, wetland, and aquatic habitats along the lower Colorado River and create an interpretive center and nature park for education and low impact recreation opportunities.

The Clean Colorado River Alliance Report

The Clean Colorado River Alliance (2006)

Arizona Governor Janet Napolitano commissioned this study in 2005 to identify the major issues or concerns affecting water quality in the Colorado River. This report identifies several pollutants of particular concern for the lower Colorado River: nutrients, metals, endocrine disrupting compounds, perchlorate, bacteria and pathogens, salinity/total dissolved solids, and sediment. It also describes the impacts of these pollutants, discusses current mitigation efforts to address them, and sets forth a number of recommendations.

Arizona Backwater Manipulations for Endangered Fishes: Management Implications of Selenium on National Wildlife Refuges of the Lower Colorado River

U.S Fish and Wildlife Service (Project ID 22410-1261-2N37) (2006)

Backwater lakes along the Colorado River are used to raise federally listed threatened and endangered native fish. This was a study to determine whether the bioaccumulation of selenium in these backwaters presented a danger to these species. The study documented continued selenium bioaccumulation in crayfish and fishes in 2001 to 2004, but water concentrations of selenium seem diminished in comparison to previous field studies. Fish and Wildlife Service will continue to monitor water sediment and crayfish.

Status of Federal and State Listed Warm Water Fishes of the Glia River Basin, with Recommendations for Management

Desert Fishes Team Report Number 1 (2003)

This report reviews the status of 12 federal and state listed native warm water fishers in the Gila River basin and the post 1967 recovery and conservation actions taken by all agencies, organizations, or parties. General conclusions and recommendations:

- Six species are extirpated from the basin,
- Five species survive in less that 20% of their original range
- The distribution and abundance of all listed species has declined since their listing and the trend is continuing.
- Although repatriation has been the primary management effort, it has occurred for only a few species and with limited success.
- Few of the recommendations in the biologically-based recovery plans have been implemented.
- Control and removal of nonnative fish species and other aquatic flora and fauna is the
 most urgent and overriding need in preventing the continued decline and ultimate
 extinction of the native fish.

Border Crossings - Water and Wastewater at the International Boundary

R.G. Charles Graf and Craig Tinney (ADEQ) and Tom Konner (EPA Region IX) September/October 2005 Southwest Hydrology (2005)

This article describes the problems and progress being made in addressing water quality and wastewater infrastructure along the Mexican border with California and Arizona for seven key populations centers: San Diego/Tijuana, Tecate, Calexico/Mexicali, San Luis/San Luis Rio Colorado (Yuma area), Nogales, Naco/Bisbee, and Douglas/Agua Prieta.

Assessments

The Colorado – Lower Gila Watershed is separated into the following drainage areas (subwatersheds):

15030101	Mohave -Havasu
15030103	Sacramento Wash
15030104	Imperial Reservoir
15030105	Bouse Wash
15030106	Tyson Wash
15030107	Lower Colorado
15030108	Yuma Desert
15070201	Lower Gila
15070202	Tenmile Wash
15070203	San Cristobal Wash

These drainage areas and the surface waters assessed as "attaining" or "impaired" are illustrated on the following watershed map. Methods used to complete these assessments are described in the "Surface Water Assessment Methods and Technical Support" document (2006).

Map Assessed waters	

COLORADO RIVER From Hoover Dam to Lake	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Mohave (below Lake Mead) 15030101 015 40.4 Miles	A&Wc – Impaired FBC – Inconclusive FC – Attaining DWS – Inconclusive AgI – Attaining AgL – Attaining	Category 5	Selenium	Added selenium in 2004

SITE NAMES ID # DATABASE # AGENCY PURPOSE		SAMPLING PERIOD: 01/12/2000 – 09/09/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Below Hoover Dam USGS #09421500 CLCLR243.26 (not in ADEQ's database)	USGS Ambient	18-23 dissolved metals only: Antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, uranium, and zinc	23 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	23 Total dissolved solid 20 Suspended sediment concentration 9 Turbidity 7-23 Pesticides

POLLUTANT	STANDARD	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
	DESIGNATED USES		
Dissolved oxygen	7.0 mg/L	04/12/2002 - 6.6 mg/L	Inconclusive – 4 of 23 samples were low in dissolved
	A&Wc	03/20/2003 - 6.4 mg/L	oxygen (binomial)
		06/30/2003 - 6.6 mg/L	
		09/04/2003 - 6.2 mg/L	
Selenium	2.0 μg/L	03/21/2000 – 3.0 μg/L	Remains impaired – 8 exceedances during the
	A&Wc chronic	04/20/2000 – 3.0 μg/L	assessment period.
		02/20/2001 – 2.2 μg/L	
	1	05/23/2002 - 2.5 μg/L	
		03/20/2003 - 2.2 μg/L	
		04/30/2003 - 2.3 μg/L	
		09/04/2003 - 2.2 μg/L	
		03/03/2004 - 2.3 μg/L	

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient E. coli bacteria and fluoride to assess FBC and DWS		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Collect additional dissolve Collect core parameters to assessment period.	enium samples to support TMDL development. ed oxygen samples due to the low readings o represent at least 3 seasons during an limit for dissolved mercury.

COLORADO RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Bill Williams River to Osborne Wash 15030104 020 13.4 Miles	A&Ww - Inconclusive FBC - Attaining FC - Attaining DWS - Attaining AgI - Attaining AgL - Attaining	Category 2 Attaining some uses	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 01/24/2000 – 08/26/2004			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Below Parker Dam USGS #09427520 CLCLR195.22 100742	USGS Ambient	17-29 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	19-20 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	17 <i>E. coli</i> bacteria 20 Fluoride 20 Total dissolved solid: 19 Turbidity	

EXCEEDANCES					
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS		
Selenium	2.0 µg/L A&Ww chronic	10/01/2003 – 3 μg/L	Inconclusive - Only 1 exceedance during the assessment period.		

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Collected all core parameters		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional selenium samples due to the exceedance.	
		Use a lower lab detection	limit for dissolved mercury.

COLORADO RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Imperial Dam to Gila River 15030107 003 15.3 Miles	A&Ww - Attaining FBC - Attaining FC - Attaining DWS - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/26/2000	0 – 08/25/2004		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
Above Imperial Dam USGS # 09429490 CLCLR048.36 100752	USGS Ambient	12-19 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	12-19 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	11 <i>E. coli</i> bacteria 19 Fluoride 19 Total dissolved solids 19 Suspended sediment concentration 18 Turbidity 5 Pesticides	

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&W/w	08/21/2003 – 5.0 mg/L 08/25/2004 – 5.7 mg/L	Attaining – Only 2 low dissolved oxygen measurements in 18 visits (binomial)

DATIONS	Low Priority – Use a lowe	r lab detection limit for dissolved mercury.
Collected all core parameters		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	PARAMETERS Collected all core parameters	PARAMETERS DISTRIBUTION Collected all core parameters

COLORADO RIVER From Main Canal to Mexico	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
border 15030107 001 32.2 Miles	A&Ww - Impaired FBC - Attaining FC - Attaining DWS - Attaining AgI - Attaining AgL - Attaining	Category 5	Selenium and low dissolved oxygen	Add selenium and dissolved oxygen to the 303(d) List

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/24/2000 – 08/26/2004 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Morelos Dam USGS # 09422000 CLCLR023.30 100744	USGS Ambient	19-30 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	19-30 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	19 E. coli bacteria 30 Fluoride 30 Total dissolved solid 30 Suspended sediment concentration 21 Turbidity 16 Pesticides 3-4 Radiochemicals

EXCEEDANCES		1 =	
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
DDE (dissolved)	0.001 µg/L Agl, AgL, FC 0.02 µg/L A&Ww chronic 0.1 µg/L - DWS	07/25/2001 – 0.24 μg/L	Inconclusive – Only 1 exceedance of the chronic standard during the assessment period. Only 1 in 16 samples exceeded other standards (binomial).
Diphthalate (dissolved)	0.0001 μg/L – FC 0.002 μg/L – DWS and A&Ww chronic 0.09 μg/L – FBC	07/25/2001 – 0.32 μg/L	Inconclusive – Only 1 exceedance of chronic standard during the assessment period.
Dissolved oxygen	6.0 mg/L A&Ww	06/21/2001 - 5.0 mg/L 07/24/2001 - 5.2 mg/L 08/23/2001 - 5.6 mg/L 08/27/2002 - 5.3 mg/L 07/29/2003 - 5.3 mg/L 08/19/2003 - 5.0 mg/L 08/24/2004 - 5.4 mg/L	Impaired – 7 of 30 samples exceeded standards (binomial).
Alpha Hexachlorocyclohexane	0.006 μg/L – DWS 0.01 μg/L – FC 0.22 μg/L – FBC	07/25/2001 – 0.31 μg/L	Attaining – Only 1 exceedance in 13 samples exceeded standards (binomial)
Gamma Hexachlorocyclohexane (Lindane)	0.2 μg/L – DWS 0.28 μg/L – A&Ww chronic	07/25/2001 – 0.42 μg/L	Inconclusive – Only 1 exceedance during the assessment period.
Mercury (dissolved)	0.01 µg/L A&Ww chronic	08/19/2003 – 0.3 μg/L	Inconclusive – Only 1 exceedance during the assessment period. The lab detection limit on all other selenium samples was above the chronic standard, so they could not be used for determine attainment.

Mercury (dissolved)	0.01 μg/L A&Ww chronic	08/19/2003 – 0.3 μg/L	Inconclusive – Only 1 exceedance during the assessment period.
Selenium	2.0 µg/L A&Ww chronic	05/20 2003 – 3.0 μg/L 08/19/2003 – 3.0 μg/L 08/24/2004 – 2.5 μg/L	Impaired – 3 exceedances during the assessment period.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
DDE, diphthalate, Gamma hexachlorocyclohexane, and mercury	Collected all core parameters		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMEN	DATIONS	TMDLs. Collect additional DDE, d mercury samples due to th	nples to support dissolved oxygen and selenium iphthalate, Gamma hexachlorocyclohexane, and ne exceedances.

GILA RIVER From Coyote Wash to Fortuna	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Wash 15070201 003 28.3 Miles	A&Ww - Inconclusive FBC - Inconclusive FC - Attaining Agl - Impaired AgL - Attaining	Category 5	Boron, selenium	Added boron and selenium in 2004

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 02/16/2000	0 – 05/18/2005	3	
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Near Dome, AZ CLGLR010.53 100455	ADEQ and USGS Ambient	8-22 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, and zinc. 22 total metals only: Boron and manganese	21-22 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	17 E. coli bacteria 22 Fluoride 18 Total dissolved solid 11 Suspended sediment concentration 22 Turbidity	

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Boron	1000 μg/L Agl	02/16/2000 – 1200 μg/L 03/21/2000 – 1500 μg/L 11/01/2001 – 1200 μg/L 05/21/2003 – 1100 μg/L 02/18/2004 – 1100 μg/L 04/23/2004 – 1700 μg/L	Remains impaired – 6 exceedances in 22 samples (binomial).
Dissolved oxygen	6.0 mg/L A&Ww	09/21/2000 – 3.2 mg/L 05/31/2001 – 5.2 mg/L 09/15/2001 – 3.4 mg/L 08/20/2002—3.5 mg/L	Inconclusive – 4 low dissolved oxygen measurements in 22 samples (Binomial method requires a minimum of 5 exceedances to be assessed as impaired.)
E. coli bacteria	235 CFU/100 ml FBC	02/22/2005 – 290 CFU/100 ml	Inconclusive – Only 1 exceedance in the last 3 years. Lab result did not exceed the screening value (300 CFU/100 ml).
Selenium	2.0 µg/L A&Ww chronic	03/21/2000 – 5.4 μg/L	Remains impaired – Only 1 exceedance during the assessment period. The lab detection limit for all other samples was above the A&Ww chronic criterion, so they could not be used to determine attainment.

DATA GAPS AND MC	DNITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and <i>E. coli</i> bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria in at least 17 samples.
MONITORING RECOMMENDATIONS		Medium Priority – Collect samples to support boron and selenium TMDL development. Collect dissolved oxygen and <i>E. coli</i> samples due to exceedances. Use a lower lab detection limit for selenium and dissolved mercury.	

HUNTER'S HOLE (Colorado River backwater)

15030108 -- 0660 15 Acres

USE SUPPORT	OVERALL ASSESSMENT
A&Ww – Inconclusive FBC – Inconclusive	Category 3
FC - Inconclusive AgL - Inconclusive	Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 09/08/200		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Mid lake CLHUN - B 102548	AGFD Ambient	1 total metals only: Chromium, copper, lead, manganese, mercury, selenium	1 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen	1 Fluoride 1 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	20 μg/L A&Ww acute	09/08/2000 – 22 μg/L	Inconclusive – Only 1 exceedance in last 3 years of monitoring. Magnitude of the exceedance should be noted.

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Insufficient core parameters	Insufficient sampling events.	Lab detection limit for total mercury was higher than the FC criterion.
MONITORING RECOMMENDATIONS		exceedance.	t additional selenium samples due to the ameters to represent at least 3 seasons during ar

LAKE HAVASU	USE SUPPORT	OVERALL ASSESSMENT	
15030101 0590 19,780 Acres	A&Ww - Inconclusive FBC - Attaining FC - Inconclusive AgI - Attaining AgL - Attaining	Category 2 Attaining some uses	

SITE NAMES DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 03/03/2000 – 09/09/2004				
		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Bass Bay - 102349 Body Beach - 100123 East State Beach - 100124 Nautical Beach - 100152 North Channel - 100168 Pilot Rock - 100157 South Channel - 100164 West State Beach - 100171 Bighorn Point - 102350 Cattail Cove - 102351 Crazy Horse Beach - 102352 Friendly Island - 102353 Frog Point - 120354 North Rotary Beach - 100123 Partners Point - 102355 Rocky Landing - 102368 Sandpoint Marina - 102356 Satellite Cove - 102357 Solitude Cove - 102357 Solitude Cove - 102359 Steamboat Cove - 102360 Three Dunes Cove - 102361 Up river - 102362 Windsor #4 - 102364 Windsor Cove - 102363 Wren Cove - 102349	Mohave County Health Dept Beach Monitoring (E. coll bacteria)	14-33 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc 9 total metals only: Thallium	29-33 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen 32 Dissolved oxygen 33 pH	1285 E. coli bacteria 34 Fluoride 31 Total dissolved solids 36 Turbidity		
Body Beach - 100132 Cattail Cove - 100124 Crazy Horse Cove - 100139 London Bridge - 100150 Middle Rotary Beach - 100122 Nautical Cove - 100151 North Rotary Beach - 100123 South Channel - 100164 South Rotary Beach - 100121 Windsor Beach - 100130 Off Windsor Beach - 100155	ADEQ Ambient (<i>E. coli</i> bacteria and field measurements)					
Parker Dam - 100098 At Colorado River - 100101 Mid Lake - 100102 Mid Thompson Bay - 100170 Site C - 100099	ADEQ Ambient					

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml	East State Beach Shoreline 05/17/2000 - GT 2000 CFU/100 ml 05/24/2000 - 1470 CFU/100 ml Crazy Horse Beach 05/17/2000 - 340 CFU/100 ml Up River 05/19/2000 - GT 2000 CFU/100 ml West State Beach Shore 05/24/2000 - 1040 CFU/100 ml Windsor Cove 05/24/2000 - 260 CFU/100 ml Nautical Beach 07/18/2000 - GT 2395 CFU/100 ml Bass Bay 08/31/2000 - 368 CFU/100 ml Windsor #4 06/21/2001 - 240 CFU/100 ml Standard Wash Cove 05/23/2002 - 501 CFU/100 ml	Inconclusive – Two exceedances at one beach, but none at that beach in the last 3 years of monitoring. Only 1 exceedance at 8 other sites. Note that only 2 exceedances occurred after 2000 at that they were at different beaches. (See additional discussion below.)
Mercury (dissolved)	0.01 μg/L – A&WW chronic 0.6 μg/L – FC	11/28/2001 – 0.8 µg/L (at 2 sites on that date)	Inconclusive – For A&Ww assessment, only 1 exceedance during the assessment period. For FC assessment, only 1 of 5 sampling events with an exceedance (2 of 8 samples, as exceedance occurred at 2 sites on the same date) (binomial).
Selenium	2.0 µg/L A&Ww chronic	05/08/2001 – 4 μg/L 09/30/2003 – 3 μg/L	Inconclusive – 2 exceedances in a 3 year period; however, both exceedances occurred near the lab detection limit (2 µg/L). Will continue to monitor selenium levels.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MO	DNITORING NEE	:DS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Mercury and selenium	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria in at least 9 samples.	
ESCHERICHIA COLI BACTER	IA EXCEEDANCES		reservoir, ADEQ assesses the bacteria exceedances ner than combining all exceedances.	
MONITORING RECOMMENDATIONS		Medium Priority -Continue bacterial monitoring at beaches. Collect additional mercury and elemium samples. (Note that the Colorado River is impaired based on selemum in upstream reaches.)		
		Use lower lab detection lin	nits for selenium and dissolved mercury.	

LAKE MOHAVE	USE SUPPORT	OVERALL ASSESSMENT	
15030101 0960 27,045 Acres (Arizona side)	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining DWS - Attaining Agl - Attaining AgL - Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 04/03/2003 – 10/29/2004 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
	-	Metals	Nutrients - Related	Other
At Davis dam CLMOH - A 100030	ADEQ Ambient	3 total and 3 dissolved metals: Cadmium, chromium, copper, lead, nickel, silver, and zinc 3 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, manganese, mercury, selenium, and thallium	3 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 3 Fluoride 3 Total dissolved solids 2 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Selenium	2.0 µg/L A&Wc chronic	10/01/2003 – 3 μg/L	Inconclusive – Only 1 exceedance during the assessment period.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Selenium	Insufficient <i>E. coli</i> bacteria samples to assess FBC.		Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional selenium samples due to the exceedance. Collect sufficient core parameters to represent at least 3 seasons during assessment period.	
		Use a lower lab detection	limit for dissolved mercury.

MARTINEZ LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15030104 0880 600 Acres	A&Ww - Attaining FBC - Attaining FC - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 08/22/200	2 – 06/10/2003	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Mid Lake CLMAZ - A 101790	ADEQ Ambient	3 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	3 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, pH 2 Dissolved oxygen	3 <i>E. coli</i> bacteria 3 Fluoride 3 Total dissolved solids 3 Turbidity

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

MONITORING RECOMMEN	DATIONS	Low Priority –Use a lower	lab detection limit for dissolved mercury.
	Collected all core parameters		Lab detection limit for dissolved mercury was below the A&W chronic criterion.
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH

MITTRY LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15030107 0950 385 acres	A&Ww – Inconclusive FBC – Attaining FC – Inconclusive	Category 2 Attaining some uses	

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/10/200	3 – 08/22/2002	
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At dam CLMIT - A 100030	ADEQ Ambient	3 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium copper, lead. manganese, mercury, nickel, selenium, silver, thallium and zinc	2 sample: Ammonia, total nitrogen, total phosphorus, nitrate/nitrite, total Kjeldahl nitrogen 3 Dissolved oxygen, pH	3 E. coli bacteria 2 Fluoride 2 Total dissolved solids 3 Turbidity

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Need dissolved metals (cadmium, copper, and zinc), mercury, fluoride, arsenic, chromium, lead, boron, manganese, and copper to assess A&Ww, FC, DWS, AgI, and AgL	-	Lab detection limit for dissolved mercury was higher than the A&W chronic criterion.
MONITORING RECOMMEN	DATIONS	Low Priority -Collect sufficient core parameters to represent at least 3 seasons during the assessment period. Use a lower lab detection limit for dissolved mercury.	

PAINTED ROCK BORROW PIT LAKE		USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
15070201 1010 185 Acres	A D E Q	A&Ww – Impaired FBC – Inconclusive FC – Inconclusive Agl – Inconclusive AgL – Inconclusive	Category 5	Low dissolved oxygen	Dissolved oxygen listed in 1992.
	E P A	FC – Impaired (Affected use only)	Category 5	DDT metabolites, toxaphene, and chlordane	EPA relisted pesticides in 2002.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/21/2000 – 04/10/2001 (dry or nearly dry since) NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Mid lake CLPRL - B 100050	USFWS for Corp of Engineers Ambient	1 total metals: Arsenic, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, and zinc	2 samples: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen 5 Dissolved oxygen, pH	1 Total dissolved solids

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	05/10/2000 – 3.0 mg/L 06/13/2000 – 3.4 mg/L	Remains impaired – 2 exceedances in 5 sampling events. Insufficient water in the lake since 2000 to monitor.

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient core parameters		Lab detection limit for selenium was higher than the A&W chronic criterion.	
DISCUSSION OF PESTICIDE IMPAIRMENT		Evidence of potential pesticide impairment: A risk assessment completed in 2006 supports continuation of the fish consumption advisories. Fish consumption advisories for pesticides in effect since 1991.		
MONITORING RECOMMENDATIONS		High Priority – Collect pesticide and dissolved oxygen samples to support TMDL development. (Must wait for lake to refill and stabilize. Has been dry for several years due to the extended drought.) Collect sufficient core parameters to represent at least three seasons during an assessment period.		
		Use a lower lab detection	limit for selenium.	

Little Colorado River

Little Colorado River Watershed

Watershed Description

This watershed is defined by the Little Colorado River, from its headwaters to the Colorado River, and tributaries to the San Juan River which flow into north and east into New Mexico and Utah. This area contains horizontally stratified sandstone and limestone which have eroded to form canyon and plateaus. In a few areas, igneous rocks have deposited on sedimentary formations due to volcanic activity. Natural erosion can be easily increased by human activities in such locations.

Land ownership is divided approximately as: 60% tribal, 12% federal, 12% private, 6% state. This 26,794 square mile watershed is sparsely populated outside of Flagstaff, with 236,500 people (including Flagstaff) (2000 census). Land use is primarily open grazing, forestry, recreation, and mining. The area contains four national monuments, four wilderness areas, and two national forests with varying levels of use restrictions.

Elevations range from 12,600 feet (above sea level) at Humphrey's Peak near Flagstaff to 2,700 feet near the Colorado River. However, most of the watershed is above 5000 feet elevation, with desert highlands flora and fauna, and coldwater aquatic communities where perennial waters exist.

Water Resources

The climate provides approximately 10 inches of rain and 15 to 20 inches of snow yearly. Snow melt has been a primary source of water for this region. The flow on the Little Colorado River is "interrupted" (stretches of perennial, intermittent, and ephemeral flow). Perennial flow is generally limited to headwaters streams.

An estimate of surface water resources in the Little Colorado Watershed is provided in **Table X.** Waters on Indian lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Table X. Estimated Surface Water Resources in the Little Colorado Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	640	1,655	9,635
	Perennial	Non-perennial	
Lake acres	16,050	6,830	

On Indian Lands - Not assessed

	Perennial	Intermittent	Ephemeral
Stream miles	305	170	15,310
	Perennial	Non-perennial	
Lake acres	5,295	118	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Map of watershed showing: Generalized topography Highways Cities National Forests, Monuments, Refuges HUCs (the subdivisions by number)

Watershed Partnerships

Little Colorado River Watershed Coordinating Council

This council looks at water quality and quantity issues across an immense watershed coving nearly 27,000 square miles that includes parts of New Mexico. They coordinate and encourage efforts by the smaller subwatershed listed below. The council meets in Holbrook or Winslow for quarterly meetings. For information contact: Ronald Smith, Project Director, at (928) 367-335 or rsmith@whitemtns.com; Jim Boles, Chair, 928-298-2422; or Larry Winn, Vice Chair, 505-879-3060.

The following subwatersheds groups are also meeting and working on projects:

- Show Low Creek Group Tom Thomas at (928) 368-8885, tthomas@ci.pinetoplakeside.az.us:
- Silver Creek Advisory Commission Ron Solomon, (928) 536-7366, ron@tayloraz.org; or Kerry Ballard, (928) 536-2539;
- Upper Little Colorado River Partnership (above Lyman Lake) Bill Greenwood, (928) 333-4128 x226, bgreenwood@eagar.com.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses - The following TMDL analyses are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL if completed can be obtained at ADEQ's website: www.azdeq.gov

- Nutrioso Creek is impaired by suspended sediment (turbidity). A TMDL was completed in 2000. Field investigations found that historic grazing and some forestry practices had contributed to a loss of riparian vegetation and stream entrenchment. Healthy riparian areas are needed to stabilized stream banks and dissipate stream energy during high flow events. Stream entrenchment causes a loss of flood plain, which leads to further increased stream velocity and related shear stress during higher flows. The silty-organic clay soils in this area are highly susceptible to water transport. The TMDL identified a variety of management practices to improve cattle grazing and forestry practices. Several of these have been implemented and effectiveness monitoring is ongoing.
- Rainbow Lake is impaired by nutrient loadings, high pH, and low dissolved oxygen. Excess nutrients can lead to high pH and low dissolved oxygen, algal blooms and even fish kills. A nutrient TMDL was approved in 2000. Nutrient load reductions were assigned to several sources to achieve water quality standards:

Septic systems – 75% reduction in nitrogen loading.

o Runoff (residential, commercial, agricultural, and forests) - 50% reductions in nitrogen and phosphorus loadings

Macrophyte (aguatic plant) decomposition - 50% reductions in nitrogen and phosphorus loadings

ADEQ is working with landowners and other interested stakeholders to implement strategies identified in the TMDL to achieve water quality standards. Further monitoring is scheduled to determine whether these strategies have been successful.

The Little Colorado River near Springerville is impaired by suspended sediment (turbidity). Suspended sediment which causes high turbidity readings represents a risk to aquatic life. A turbidity/suspended sediment TMDL was completed in 2002. The investigation indicated that sediment loadings actually start upstream of these segments. The main cause of the suspended sediments is loss of vegetative cover due to historic grazing practices. Loss of vegetation, especially in the riparian area, allows increased runoff, soil erosion, and bank destabilization. Effective management strategies include increasing riparian vegetation, stream bank stabilization,

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maintenance of flood plains, and minimization of the impact of cattle in the general area. ADEQ has been working with landowners and other interested stakeholders to implement strategies to reduce sediment transport in the Little Colorado River. Further monitoring to determine the effectiveness of implemented strategies is ongoing.

- The Little Colorado River near Joseph City is impaired due to copper, silver, and suspended sediment concentration (SSC). These pollutants pose a risk to aquatic life and wildlife. Further monitoring is needed to identify sources in this drainage area. TMDLs will be initiated in 2007.
- The Little Colorado River near Woodruff is impaired due to E. coli bacteria and suspended sediment. Escherichia coli contamination presents a significant public health concern if people are swimming or even wading in the water. A bacteria TMDL will be initiated in 2007. Monitoring for the sediment TMDL will occur in conjunction with monitoring for the other TMDLs on the Little Colorado River.
- Lakes in the Lake Mary region near Flagstaff are impaired by mercury: Upper Lake Mary, Lower Lake Mary, Lower Long Lake, Soldiers Lake, and Soldiers Annex Lake. Fish consumption advisories have been issued at each of these lakes because consumption of mercury poses risks to humans who eat the fish. Mercury also poses risks to other animals that prey on the fish.

A draft model development report for the Lake Mary region (Malcolm Pirnie, 2006) indicates that mercury is from indirect sources such as: air deposition to the lake and to the watershed (transported to the lakes via runoff), ground water, and natural background. Several remediation scenarios were evaluated using the model: lake aeration, sediment dredging, watershed load reduction, lake level management, and fisheries management. This analysis indicated that reduction of water column concentrations would require reductions in atmospheric loads directly and by reducing soil erosion in the watershed. A draft TMDL should be completed in 2006.

- Lyman Lake (near Springerville) is also impaired by mercury. A fish consumption advisory has been issued at this lake because consumption of mercury poses risks to humans who eat the fish. Mercury also poses risks to other animals that prey on the fish.
- Bear Canyon Lake is impaired by low pH (alkaline conditions) Low pH conditions can negatively impact most designated uses (swimming, aquatic life, agriculture). A TMDL is scheduled and will investigate whether sources of this water quality problem.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

- **EC Bar Ranch Turbidity Reduction Projects** EC Bar Ranch (2000, 2001, 2002, 2003, 2004, and 2005) Restore riparian conditions by exclude cattle from riparian areas and provide alternative water sources for cattle. This should result in stream bank stabilization and reductions in sediment loading to Nutrioso Creek.
- Rogers Ranch Turbidity Reduction Project Rogers Ranch (2000) Restore riparian vegetation and stream bank stability by excluding cattle from riparian areas and providing alternative water sources along Nutrioso Creek.

Big Ditch Water Quality Improvement Project

The Town of Eager (2000)

Line "Big Ditch", an irrigation canal, to reduce leakage and improve riparian growth.

Murray Basin - Saffel Canyon Phase II Project

The Apache Sitgreaves National Forest (2001)

Restore stream channels to their natural form and function on two severely degraded tributaries to Nutrioso Creek. Project includes realigning and regrading roads, obliterated some roads, and revegetated some disturbed sites in the Apache Sitgreaves National Forest.

Overgaard Townsite Water Protection Project

The Overgaard Domestic Wastewater Improvement District (2001, 2004) Connect 20 homes to a 10,000 gallon septic tank and leach field to protect public health and underlying aquifers and nearby streams.

Greenwood Sediment Reduction Project

The Apache Sitgreaves National Forest (2001)

Reconstruct and realign forest roads to reduce sediment contributions to Nutrioso Creek. Erosion stabilization techniques were applied to control active head-cutting and bank erosion caused by roads.

Best Management Practices for Wastewater Treatment at Tolani Lake Project

The Navajo Nation (2001)

Develop a modern wastewater lagoon system and constructed wetland at Tolani Lake. The project was used to teach and promote best management practices associated with the operation and maintenance of wastewater systems, including effluent reuse.

Juan Curley Project

The Navajo Nation (2004)

Develop and implement a grazing management plan for a 270 acre Navajo allotment. The plan is to identify strategies to reduce stream bank and gully erosion.

Hell's Hole Spring Development Project

Apache-Sitgreaves National Forest (2003)

Improve water quality, wetland function, and water capacity at the following springs: Yellow Bull, Upper Linden, Coyote, and Miner.

Water Protection Fund Projects – The following Water Protection Fund Projects have been awarded by the Arizona Department of Water Resources. Information about these funds or projects can be obtained from ADWR at: http://www.azwater.gov.

Murray Basin - Saffel Canyon Phase II Project

The Apache-Sitgreaves National Forest (2000)

Restore stream channels to their natural form and function on two severely degraded tributaries to Nutrioso Creek. The Forest Service also realigned and regraded roads, obliterated some roads, and revegetated some disturbed sites.

Pueblo Colorado Wash Project

Hubbell Trading Post Natural Site (2000)

Continue the riparian area restoration of Pueblo Colorado Wash. This project was first funded in 1997 and has been successful in reestablishing the natural sinuosity of the channel, function of the riparian area, and natural vegetative communities in the area.

Hubbell Trading Post Riparian Restoration using Treated Effluent Project

Hubbell Trading Post Natural Site (2000)

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In conjunction with the project above, develop a distributions system to use secondary treated effluent to irrigate four acres of flood plain while reestablishing native vegetation in this riparian area.

Lake Mary Watershed Streams Restoration Project

Northern Arizona University (2000)

Reduce sedimentation in tributaries to both Upper and Lower Lake Mary. The project will modify stream channels, revegetate riparian areas, and where possible, relocate roads further from the tributaries.

Upper Fairchild Draw Riparian Restoration Project

Apache Sitgreaves National Forest (2000)

Build an 8-foot high fence to enclose grazing wildlife from a 14 acre wet meadow and plant willows within the enclosure. This work is to reduce detrimental grazing, improve riparian conditions in this headwater to Willow Creek, and therefore, reduce sediment loadings.

Round Valley Water Users Project

Town of Eagar and Round Valley Water Users Association Project (2000)
Study water losses due to current irrigation delivery system and feasibility of a more efficient system. Reductions in water losses are expected to encourage riparian area growth and therefore water quality in the Little Colorado River.

Polacca Wash Grazing Management Project

The Hope Tribe (2000)

Exclude livestock from riparian areas and revegetate using native plants along portions of Polacca Wash.

Wet Meadows – A Riparian Restoration Project

The National Wild Turkey Federation (2003)

Fence off wildlife from five wet meadows in the Apache Sitgreaves National Forest.

• Wilkins' Little Colorado River Riparian Enhancement Project

Ranchers (2003)

In collaboration with Arizona Game and Fish Department, revegetate using native plants, stabilize 1/2 mile of stream banks, and create better wildlife habitat along the Little Colorado River near 1/2 Springerville.

Diamond X Ranch Riparlan Enhancement Project

Diamond X Ranch (2004)

Revegetate and improve riparian conditions along the Little Colorado River to reduce sediment loading.

• EC Bar Ranch Well and Drinker Project

EC Bar Ranch (2004)

Develop alternative water sources to minimize livestock and wildlife use of a fragile riparian area along Nutrioso Creek.

Other Water Quality Studies

Bathymetric Study of Northern Arizona Lakes – Draft Final Report

Paul Gremillion and Cristina Piastrini, Northern Arizona University (2005)

Bathymetric maps of the following lakes were created to support the development of Total maximum Daily Loads for mercury and other water quality studies: Ashurst Lake, Kinnikinick Lake, Long Lake, Lower Lake Mary, Upper Lake Mary, Soldier Lake, and Soldier Annex Lake.

Along with the maps, tables of surface area and volume versus storage were developed for these seven lakes.

Upper Little Colorado River Concept Plan – A Road Map and Resource Guide to Riparian **Enhancement for Private Landowners**

Tom Moody, Ruth Valencia, Kelly Wirtanen, and Mark Wirtanen, Northern Arizona University, College of Engineering and Technology, Dept of Civil and Environmental Engineering (2001) This report provides information to the riverside landowner for the management of their private lands. It describes fundamental characteristics of a stream and its riparian community and recommends specific practices to reduce bank erosion and channel incision, and improve riparian condition, fishery habitat, livestock watering, and water diversions. The plan also provides information about regulatory permits necessary to conduct projects in and along the riparian corridor and a set of potential funding sources for stream enhancement projects.

- Generalized Hydrogeology and Ground Water Budget for the C Aquifer, Little Colorado River Basin and Parts of the Verde and Salt River Basins, Arizona and New Mexico Robert J. Hart, John J. Ward, Donald J. Bills, and Marilyn E. Flynn – U.S.G.S.(2002) This report discusses the hydrogeology, structural controls, aquifers, ground water movement and development, interaction of ground water and surface water, and ground water budget components for the C aquifer. The C aquifer covers more than 27,000 square miles and is the most productive aquifer in the Little Colorado River Watershed. It has a direct hydraulic connection to the Little Colorado River in some places, especially at spring discharges in the lower 13 miles (just above the Colorado River confluence). Ground water pumpage from the C aquifer during 1995 was about 140,000 acre-feet. Discharge from the C aquifer is estimated to be 319,000 acre-feet/year, with downward leakage to limestones accounting for most of the total discharge.
- Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2000-2001, and Performance and Sensitivity of the 1988 USGS Numerical Model of the N Aquifer

Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2002)

The N aguifer is the major source of water in the 5,400 square mile Black Mesa area in northeastern Arizona. Since 1971, monitoring has been designed to determine the long term effects of ground water withdrawals from the N aquifer for industrial and municipal uses. During the past 10 years, total withdrawals increased at an average rate of about 3% per year. Water levels in 33 wells dropped an average of 17 feet during the past 35 years (ranging 169-foot drop to 10-foot increase). Long-term effects of pumping on surface waters could not be measured. No significant trend in the annual average discharges for Moenkopi Wash and Laguna Creek, while median winter flows for Dinnebito Wash and Polacca Wash have decreased during the last 6 years.

Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2001-2002

Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2002) This is a continuation of study above.

 Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2001-2002

Blakemore E. Thomas - U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2003) This is a continuation of study above.

Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2002-2003

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Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2004)
This is a continuation of study above.

• Ground Water, Surface Water, and Water Chemistry Data, Black Mesa Area, Northeastern Arizona 2003-2004

Blakemore E. Thomas – U.S. Geological Survey, in cooperation with the Arizona Dept of Water Resources and Bureau of Indian Affairs (2005)

This is a continuation of study above.

 Hydrology of the D Aquifer and Movement and Ages of Ground Water Determined from Geochemical and Isotopic Analyses, Black Mesa Area, Northeastern Arizona.
 Margot Truini and Steve A. Longsworth, U.S. Geological Survey, in cooperation with the Bureau of Indian Affairs (2003)

Water samples from the D aquifer contain higher concentrations of dissolved solids than samples from the N aquifer; therefore, the Navajo Nation and the Hopi Tribe in Black Mesa are concerned about leakage from the overlying D aquifer into the N aquifer which is their primary source of potable water. The study found that leakage is most likely to occur in the southern part of Black Mesa.

- Water Quality Data form Navajo National Monument, Northeastern Arizona 2001-2002
 Blakemore E. Thomas U.S.G.S., in cooperation with the National Park Service (2003)
 Water samples were collected from two springs and one well near Betatakin ruin, one spring near Keet Seel Ruin, and one spring and one stream near Inscription House Ruin in 2001 and 2002.
 Water from all sites is from the N aquifer.
- Water Quality Data for Walnut Canyon and Wupatki National Monuments, Arizona 2001-02
 Blakemore E. Thomas, U.S. Geological Survey in cooperation with the National Park Service
 (2003)

Water quality data were collected from Cherry Canyon seep in Walnut Canyon, the Walnut Canyon headquarters well, Heiser Spring in Wupatki, and from the Little Colorado River at the edge of Wupatki to provide baseline water quality information.

Assessments

The Little Colorado River Watershed can be separated into the following drainage areas (subwatersheds):

14080105	La Plata River Drainage Area (Tribal Land – Not assessed)
14080106	Charco River Drainage Area (Tribal Land – Not assessed)
14080201	Cottonwood Creek Drainage Area (Tribal Land – Not assessed)
14080204	Chinle Wash Drainage Area (Tribal Land - Not assessed)
14080205	Oljeto Wash Drainage Area (Tribal Land - Not assessed)
15020001	Little Colorado River Headwaters Drainage Area
15020002	Upper Little Colorado River Drainage Area
15020003	Carrizo Wash Drainage Area
15020004	Zuni River Drainage Area
15020005	Silver Creek Drainage Area
15020006	Upper Puerco River Drainage Area (Tribal Land - Not assessed)
15020007	Lower Puerco River Drainage Area
15020008	Middle Little Colorado River Drainage Area
15020009	Wide Ruin Wash Drainage Area
15020010	Chevelon Canyon Drainage Area
15020011	Puerco Colorado Wash Drainage Area
15020012	Oraibi Wash Drainage Area (Tribal Land – Not assessed)

15020013	Polacca Wash Drainage Area (Tribal Land - Not assessed)
15020014	Jadito Wash Drainage Area (Tribal Land - Not assessed)
15020015	Canyon Diablo Drainage Area
15020016	Lower Little Colorado River Drainage Area
15020017	Dinnebito Wash Drainage Area (Tribal Land - Not assessed)
15020018	Moenkopi Wash Drainage Area (Tribal Land - Not assessed)

These drainage areas and the surface waters assessed as "attaining" or "impaired" are illustrated on the following watershed map. Methods used to complete these assessments are described in the "Surface Water Assessment Methods and Technical Support" document (2006).

Map of Little Colorado Headwaters Drainage Area – 14010006

All streams and lakes in HUC
Assessments (Thick Red Impaired, Thick Blue attaining)
Monitoring sites black triangle
Identify by name any assessed and the main stem stream

ASHURST LAKE	USE SUPPORT	OVERALL ASSESSMENT
15020015 0090 200 Acres	A&Wc - Inconclusive FBC - Attaining FC - Attaining Agl Attaining AgL - Attaining	Category 2 Attaining some uses

MONITORING	G USED IN THIS	ASSESSMENT			
SITE NAMES ID #	AGENCY PURPOSE				
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At dam LCASH - A 100973	ADEQ Ambient	4-5 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium,	5-8 sample: Ammonia, total nitrogen, nitrite/nitrate, total	3 <i>E. coli</i> bacteria 7 Fluoride 7 Total dissolved solids	
Mid Lake LCASH – B 101294	ADEQ Ambient	chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	5 Turbidity	
Boat Ramp LCASH – BR 101327	ADEQ Ambient (bacteria only)	7 total and 4 dissolved: Mercury			

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	09/09/2004 – 6.1 mg/L	Inconclusive – Low dissolved oxygen in 1 of 7 sampling events (1 of 9 samples) (binomial).

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
Dissolved oxygen	Insufficient dissolved metals (cadmium, copper and zinc) to assess A&Wc.		The lab detection limits for dissolved cadmium, copper, lead, mercury, and silver and total selenium were higher than the chronic A&W criteria for at least one sample.
MONITORING RECOMMEN	DATIONS	exceedance. Note that the in 5 of 5 samples. Turbidit of excess nutrient loadings nutrient standard should be determine whether narrat Collect sufficient core para	additional dissolved oxygen due to the cold turbidity standard (10 NTU) was exceeded by and low dissolved oxygen may be symptoms. New methods for implementing the narrative be applied to this lake once adopted, to live nutrient violations are occurring. Sameters to represent at least 3 seasons.

BABBIT SPRING WASH	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Upper Lake Mary 15020015 210 2.3 Miles	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE			
DATABASE #				
		Metals	Nutrients - Related	Other
Near Upper Lake Mary LCBB\$000.02 102344	ADEQ TMDL	4 total and 4 dissolved metals: Mercury 2 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc.	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen. 3-4: Dissolved oxygen, pH	4 Fluoride 3 Total dissolved solids 3 Turbidity

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 µg/L A&Wc chronic	09/10/2003 – 0.013 μg/L	Inconclusive – Only 1 exceedance during the assessment period.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Insufficient dissolved metals (cadmium, copper, and zinc) and <i>E. coli</i> bacteria samples to assess A&W and FBC.	Insufficient sampling events	Lab detection limits for dissolved cadmium, copper, lead, and silver were higher than A&Wc chronic criteria.
MONITORING RECOMMEN	DATIONS		mercury samples due to the exceedance. meters to represent at least 3 seasons during

BARBERSHOP CANYON CREEK	USE SUPPORT	OVERALL ASSESSMENT	_
From headwaters to East Clear Creek 15020008 - 537 10.2 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE				
DATABASE #		NUMBER AND TYPES OF SAM	D TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other	
Below Merritt Draw LCBRB006.74 100410	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity	

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/26/2001 – 6.5 mg/L 07/31/2001 – 6.6 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. Flow 0.01 cfs. Low nutrients (nitrogen 0.1-0.3 mg/L, phosphorus 0.01 mg/L)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wo chronic criteria.
MONITORING RECOMMEN	IDATIONS	Low Priority –Use lower la mercury.	b detection limits for selenium and dissolved

BEAR CANYON LAKE 15020008 0130		USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
55 Acres	A D E Q	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining AgI - Attaining AgL - Inconclusive	Category 2 Attaining some uses		
	E P A	A&Wc – Impaired FBC – Impaired AgL – Impaired	Category 5	Low pH	EPA listed due to low pH in 2004.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

PURPOSE	SAMPLING PERIOD: 06/20/200			
	NUMBER AND TYPES OF SAMPLES			
	Metals	Nutrients – Related	Other	
ADEQ Ambient	3-5 total and 0-1 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium,	4-6 sample: Ammonia, total nitrogen, nitrite/nitrate, total	3 E. coli bacteria 4 Fluoride 4 Total dissolved solids	
ADEQ Ambient	chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 Turbidity	
	ADEQ Ambient	PURPOSE NUMBER AND TYPES OF SAMP Metals ADEQ Ambient Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, Ambient manganese, mercury, nickel,	PURPOSE NUMBER AND TYPES OF SAMPLES	

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	10/18/2000 – 6.6 mg/L	Inconclusive – 1 in 4 samples below criterion. (Binomial)
pН	6.5-9.0 SU A&Wc, FBC, AgL	10/18/2000 - 5.8 SU 05/16/2001 - 6.2 SU 06/13/2001 - 6.3 SU 09/18/2001 - 5.9 SU	Inconclusive – Low pH recorded near the bottom of the lake on each of 4 visits. All low pH values occurred at between 7 to 11.8 meters deep.

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Dissolved oxygen	Missing dissolved metals (copper, cadmium, and zinc) to assess A&Wc.		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, and selenium) and total selenium were higher than applicable criteria.	
DISCUSSION OF LOW PH		Evidence of potential impairment by low pH: 1. No data since the last assessment, and 2. All low pH values occurred between 7 to 12 meters deep, which may be due to natural conditions near the lake bottom		
MONITORING RECOMMENDATIONS		High Priority – Collect ph Collect additional dissolve Collect sufficient core par	Heasurements to support TMDL development ed oxygen samples due to the exceedances, ameters to represent at least 3 seasons, imits for dissolved metals and selenium.	

BILLY CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Show Low Creek 15020005 019 18.5 Miles	A&Wc – Attaining FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/06/2000 – 09/11/2001				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At Pinetop, AZ LCBIL005.75 100946	ADEQ Ambient	8 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, chromium,	8 samples: Ammonia, total nitrogen, nitrite/nitrate, total	8 <i>E. coli</i> bacteria 8 Fluoride 8 Total dissolved solid:		
Above Porter Creek LCBIL000.01 100947	ADEQ Ambient	mercury nickel, silver, thallium, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	8 Turbidity		
		8 total metals only: Cadmium, copper, lead, and silver				
		(4 samples at each of 2 sites)				

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/26/2001 – 5.8 (both sites)	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling.
E. coli bacteria	235 CFU/100 ml FBC	11/06/2000 – 420 CFU/100 ml	Inconclusive - Only 1 exceedance in the last 3 years of monitoring (4 events)

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DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
E. coli bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMEN	IDATIONS	exceedance. Use lower lab detection li Note that the old turbidit samples, which may indic implementing the narrativ	mits for selenium and dissolved mercury. y criterion (10 NTU) was exceeded in 3 of 8 ate excess nutrient loading. New methods for re nutrient standard should be applied to this ermine whether narrative nutrient violations are

BLACK CANYON LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15020010 0180 35 Acres	A&Wc - Inconclusive FBC - Attaining FC - Attaining DWS - Inconclusive Agl - Attaining AgL - Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/04/2002 – 11/02/2004 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
At Dam LCBLC - A 100014	AGFD Ambient	1-2 total metals only: Arsenic, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc	7-8 samples total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 Fluoride 8 Total dissolved solids 6 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	10/04/2002 – 3.3 mg/L 11/13/2002 – 6.1 mg/L 10/20/2003 – 5.7 mg/L	Inconclusive – 3 in 8 samples below criterion. (Binomial)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient samples to assess any designated use.		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury) and selenium were higher than applicable criteria.
MONITORING RECOMMENDATIONS		exceedances. Note that the in 3 of 6 samples. Turbidit of excess nutrient loading nutrient standard should be determine whether narrat Collect sufficient core para	andditional dissolved oxygen samples due to the se old turbidity criterion (10 NTU) was exceeded ty and low dissolved oxygen may be symptoms. New methods for implementing the narrative of applied to this lake once adopted, to live nutrient violations are occurring. Implementations are occurring.

BLUE RIDGE RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT	
15020008 0200 290 Acres	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining AgI - Attaining AgL - Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/17/2000 – 07/13/2004			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At Dam LCBRR - A 100974	ADEQ Ambient	4-5 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium,	4-5 sample: Ammonia, total nitrogen, nitrite/nitrate, total	1 <i>E. coli</i> bacteria 5 Fluoride 4 Total dissolved solids	
North inlet LCBRR- C 101293	ADEQ Ambient	chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances		,	

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient dissolved metals (copper, cadmium, and zinc) and E. coli bacteria to assess A&Wc and FBC.		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, and silver) were higher than applicable criteria.
assess A&Wc and FBC. MONITORING RECOMMENDATIONS		Low Priority –Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals.	

BROWN CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Silver Creek 15020005-016 14.5 Miles	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Below Brown Spring (Below cattle exclosure) LCBRO018.96 101242	ADEQ Special investigation	2 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel,	2 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total	2 E. coli bacteria 2 Fluoride 2 Total dissolved solids 2 Turbidity	
Outside cattle exclosure LCBRO018.13 101241	ADEQ Special investigation	silver, thallium, and zinc 2 total metals only: Boron, manganese	Kjeldahl nitrogen, dissolved oxygen, pH		
		(2 sites – only one date)			

EXCEEDANC			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/20/2001 – 6.0 mg/L	Attaining – Low dissolved oxygen due to low flow conditions and ground water upwelling. Flow was 1.5 cfs. Low nutrients (0.09 nitrogen and 0.07 mg/l phosphorus)

DATA GAPS AND MO			
EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for selenium and dissolved mercury.	

BUNCH RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT	
15020001 0230 65 Acres	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive Agl - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 04/17/20	001 – 10/17/2001	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Mid lake LCBUN - B 102537	AGFD Ambient	3 total metals only: Copper, manganese, and zinc	3 sample: Ammonia, total nitrogen, total phosphorus, total Kjeldahl nitrogen, nitrate/nitrite, dissolved oxygen, pH	3 Total dissolved solids

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/25/2001 – 6.1 mg/L 10/17/2001 – 5.6 mg/L	Inconclusive – 2 exceedances in 3 samples (Requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

DATA GAPS AND MC	NITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Dissolved oxygen	Missing dissolved metals (copper, cadmium, and zinc), mercury, <i>E. coli</i> bacteria, boron, manganese, and lead to assess designated uses.			
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen samples due to the exceedances. Collect sufficient core parameters to represent at least 3 seasons.		
		for implementing the narr	ry indicate excess nutrient loading. New methods rative nutrient standard should be applied to this termine whether narrative nutrient violations are	

CARNERO LAKE	USE SUPPORT	OVERALL ASSESSMENT
15020001 0260 65 Acres	A&Wc Inconclusive FBC Inconclusive FC Attaining AgL Inconclusive	Category 2 Attaining some uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIODS: 04/25/200	01-10/16/2001; 08/17/20	04 – 05/25/2005
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Deepest part of lake LCCAR - A 101839	ADEQ Ambient	3 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	5-6 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 Fluoride 5 Total dissolved solids

		T	
POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
	DESIGNATED USES		
Dissolved oxygen	7.0 mg/L A&Wc	07/24/2001 – 3.8 mg/L	Inconclusive – Low dissolved oxygen in 1 of 5 sampling events.
pН	<9.0 SU A&Wc, FBC, AgL	07/24/2001 – 9.9 SU 10/16/2001 – 9.7 SU	Inconclusive – High pH in 2 of 6 sampling events.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and pH	Insufficient <i>E. coli</i> bacteria and dissolved metals (cadmium, copper and zinc) to assess A&W and FBC.		The lab detection limits for dissolved metals (cadmium, copper, lead) and total selenium were higher than the chronic A&W criteria for at least 1 sample.
		exceedances. Low dissolve excess nutrient loading. N nutrient standard should t determine whether narrat Collect sufficient core para	additional dissolved oxygen and pH due to ed oxygen and high pH may be symptoms of ew methods for implementing the narrative be applied to this lake once adopted, to ive nutrient violations are occurring. The ameters to represent at least 3 seasons. The ameters to dissolved metals and selenium.

CHEVELON CANYON CREEK	USE SUPPORT	OVERALL ASSESSMENT
From Black Canyon Creek to Little Colorado River 15020010 001 19.3 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 12/19/200	0 - 07/30/2001		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Below diversion dam near Winslow, AZ LCCHC000.91 100341	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron, manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity	

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	

CHOLLA LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15020008 0320 130 Acres	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 06/18/2001 NUMBER AND TYPES OF SAMPLES			
DATABASE #					
		Metals	Nutrients - Related	Other	
Mid Lake LCCHO - B 102541	AGFD Ambient	2 total metals only: Arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury,	2 sample: Ammonia, total nitrogen, nitrite/nitrate, total	2 Fluoride 2 Total dissolved solid	
Warmwater inlet LCCHO – IN 102540	AGFD Ambient	nickel, silver, and zinc	Kjeldahl nitrogen, dissolved oxygen, pH		

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MO	MITORING NEEDS			
EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW	
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH	
	Insufficient dissolved metals (copper, cadmium, and zinc) and <i>E. coli</i> bacteria, and mercury to assess A&Ww, FBC, and FC	Insufficient sampling events	Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria.	
MONITORING RECOMMENDATIONS assess A&Ww, FBC, and FC		Low Priority –Collect sufficient core parameters to represent at least 3 seasons. Use lower lab detection limits for dissolved metals and selenium		

COLTER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Nutrioso Creek 15020001-293 8.6 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining Agl Attaining AgL - Attaining	Category 1 Attaining all uses	

MONITORING U	SED IN THI	S ASSESSMENT			
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/19/2000 – 08/30/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
Above Rogers Reservoir LCCOL005.53 102020	ADEQ TMDL (turbidity only)	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel,	3-4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 1 Suspended sediment	
Near Nutrioso, AZ LCCOL003.03 100935	ADEQ Ambient	silver, thallium, and zinc 4 total metals only: Boron and manganese	Kjeldahl nitrogen, dissolved oxygen, pH	concentration 6 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters.		Lab detection limits for selenium and dissolved mercury were higher than A&Wo chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for dissolved metals.	

EAST CLEAR CREEK	USE SUPPORT	OVERALL ASSESSMENT
From headwaters to Yeager Creek 15020008 009 38.0 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 12/20/2000 – 07/31/2001 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
Above Yeager Canyon LCECL017.75 100537	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron and manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solide 4 Turbidity

EXCEEDANCES				
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS	
Dissolved oxygen	7.0 mg/L A&Wc	06/26/2001 – 5.4 mg/L 07/31/2001 – 6.1 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. (Flow 0.7 and 0.8 cfs and low nutrients concentrations.)	

DATA GAPS AND MC	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab detection limits for selenium and dissolved mercury.	

EAST FORK LITTLE COLORADO CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From handwaters to Hall Creek	A&Wc - Attaining FBC - Attaining FC - Attaining AgL - Attaining	Category 1 Attaining all uses	-

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/08/2000 – 09/12/2001 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Montlure Church Camp near Greer LCELR000.99 100948	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron and manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	DNITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower la mercury.	b detection limits for selenium and dissolved

FISH CREEK	USE SUPPORT	OVERALL ASSESSMENT
From headwaters to Little Colorado River 15020001 211 9.0 Miles	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgL - Inconclusive	Category 3 Inconclusive

SITE NAMES ID#	AGENCY PURPOSE	SAMPLING PERIOD: 06/18/2001 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
Above Forest Road #118 LCFIS003.86 101244	ADEQ Ambient	I total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc I total metals only: Boron, manganese	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solids 5 Turbidity

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 μg/L – A&Wc 0.6 μg/L – FC	06/18/2001 – 0.8 μg/L	Inconclusive – Only sample collected exceeded both criteria during the assessment period.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Insufficient core parameters	Insufficient sampling events.	Lab detection limit for selenium was higher than A&W chronic criterion.
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional mercury samples due to the exceedance.	
		Collect sufficient core par-	ameters to represent at least 3 seasons.
		Use lower lab detection li	mits for selenium.

USE SUPPORT	OVERALL ASSESSMENT	
A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	
	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive	ASSESSMENT A&Wc - Inconclusive Category 3 FBC - Inconclusive Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 08/08/2003 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
At dam LCFOO - A 100023	ADEQ Ambient	1 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 1 total metals only: Boron, manganese	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solids 1 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/08/2003 - 6.5- 6.7	Inconclusive – Low dissolved oxygen on only 1 sampling date. (Binomial)
Selenium	2.0 μg/L A&Wc chronic	08/08/2003 – 10 μg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Dissolved oxygen and selenium Insufficient core parameters		Insufficient sampling events.	Lab detection limits for selenium and dissolved mercury were higher than the A&Wc chronic criterion.	
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional dissolved oxygen and selenium of to exceedances. Collect sufficient core parameters to represent at least 3 seasons.		
		Use a lower lab detection limit for selenium and dissolved mercury.		

HALL CREEK	USE SUPPORT	OVERALL ASSESSMENT
From headwaters to Little Colorado River 15020001 012 14.3 Miles	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive Agl - Inconclusive AgL - Inconclusive	Category 3 Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/20	00 – 06/19/2001	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Highway 273 LCHAL008.83 101263	ADEQ Ambient	1 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium,	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total	1 E. coli bacteria 1 Fluoride 1 Total dissolved solids
Highway 373 bridge LCHAL000.85 102274	ADEQ TMDL	copper, lead, mercury, nickel, silver, thallium, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	5 Turbidity
		1 total metals only: Boron and manganese		

EXCEEDANC	LJ		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/19/2001 - 6.5 mg/L	Attaining – Low dissolved oxygen due to low flow conditions and ground water upwelling. Flow was 0.1 cfs.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	Lab detection limits for selenium and dissolved mercury were higher than the A&Wc chronic criterion.
MONITORING RECOMMENDATIONS		Low Priority Collect suff seasons.	ficient core parameters to represent at least 3
		Use lower lab detection li	imits for selenium and dissolved mercury.

OV ASS	USE SUPPORT	INIKINICK LAK
usive Cat Att son	A&Wc – Inconclu FBC – Attaining FC – Attaining AgL – Attaining	20015 0730 Acres

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/16/2000 – 04/13/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At dam LCKIN - A 100971	ADEQ Ambient	6-9 total and 0-1 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium,	6-10 sample: Ammonia, total nitrogen, nitrite/nitrate, total	3 <i>E. coli</i> bacteria 8 Fluoride 10 Total dissolved solid:	
Mid Lake LCKIN – B 100972	ADEQ Ambient	chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	8 Turbidity	
Boat Ramp LCKIN – BR 101325	ADEQ Ambient (bacteria only)	9 total and 4 dissolved: Mercury			

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	09/09/2004 - 6.3 mg/L	Attaining—Low dissolved oxygen in 1 of 10 sampling events (1 of 12 samples).
Lead (dissolved)	1.1 µg/L at 47 mg/L hardness A&Wc chronic	06/14/2001 – 2 μg/L	Inconclusive. Only marginally over the criterion. Only 1 sample analyzed for dissolved lead.

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead	Insufficient dissolved metals (cadmium, copper and zinc) to assess A&Wc.		The lab detection limits (for at least 1 sample) for dissolved cadmium, copper, mercury, and silver were higher than the chronic A&W criteria.
MONITORING RECOMMEN	IDATIONS	Collect sufficient core para Use lower lab detection li Note that the old turbidit sampling events where tu turbidity may indicate exc implementing the narrativ	ditional lead samples due to the exceedance. ameters to represent at least 3 seasons. mits for dissolved metals. y criterion (10 NTU) was exceeded in all 8 rbidity was analyzed. Low dissolved oxygen and sess nutrient loading. New methods for we nutrient standard should be applied to this termine whether narrative nutrient violations are

LAKE MARY (LOWER)	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
15020015 0890 765 Acres		A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3		
	E P A	FC - Impaired (Affected use only)	Category 5 Impaired	Mercury In fish tissue	EPA listed mercury in 2002. Regional mercury TMDL to be completed in 2006.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 05/02/2002 – 04/12/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
At dam LCMAL - A 102253	ADEQ TMDL	6 total and 6 dissolved metals: Mercury 2 total and 0-2 dissolved metals:	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total	5 Fluoride 6 Total dissolved solids 1 Turbidity
Mid Lake LCMAL – B 103360	ADEQ TMDL	Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	05/14/2003 – 5.2	Inconclusive – Low dissolved oxygen in 1 of 6 sampling events (binomial).
рН	<9.0 SU A&Wc, FBC, AgL	09/08/2004 - 9.4 SU 08/13/2003 - 10.2 SU	Inconclusive – 2 exceedances in 6 sampling events (7 samples). A minimum of 5 exceedances and 20 samples for impairment decision (binomial).

Pollutant: Assume "total" concentration, unless shown as dissolved.

DATA GAPS AND MC	INITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and pH	Insufficient dissolved metals (cadmium, copper and zinc), <i>E. coli</i> bacteria, copper and lead to assess A&Wc, FBC, and AgL.		The lab detection limits for dissolved metals (cadmium, copper and lead) were higher than the chronic A&W criteria for at least 1 sample.
DISCUSSION OF MERCURY	MPAIRMENT	effect; and	cury impairment: sumption advisory issued in 2002 remains in be completed and approved in 2007.
MONITORING RECOMMENDATIONS		mercury TMDL. Collect at to the exceedances. Low d excess nutrient loading. No nutrient standard should b determine whether narrati	rcury samples to support completion of the dditional dissolved oxygen and pH samples due lissolved oxygen and pH may indicate an ew methods for implementing the narrative e applied to this lake once adopted, to the nutrient violations are occurring, ameters to represent at least 3 seasons.

LAKE MARY (UPPER)		USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
15020015 0900 860 Acres	A D E Q	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining DWS - Inconclusive AgL - Attaining	Category 2 Attaining Some uses		
	E P A	FC – Impaired (Affected use only)	Category 5 Impaired	Mercury in fish tissue	EPA listed mercury in 2002. Regional mercury TMDL to be completed in 2006.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING U	ISED IN THE				
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 05/02/2002 – 04/12/2005			
DATABASE #		NUMBER AND TYPES OF SAME	PLES		
		Metals	Nutrients – Related	Other	
At dam LCMAU - A 100029	ADEQ TMDL	17 total and 17 dissolved: Mercury 9 total and 3-9 dissolved metals: Antimony, arsenic, barium,	9-17 samples: Ammonia, total nitrogen, nitrite/nitrate, total	2 <i>E. coli</i> bacteria 12 Fluoride 17 Total dissolved solids	
Mid lake LCMAU – B 101342	ADEQ TMDL	beryllium, boron, chromium, lead, manganese, nickel, selenium, thallium, and zinc 9 total and 0-2 dissolved: Cadmium, copper, and silver	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	11 Turbidity	
Near dam LCMAU – A1 101312	ADEQ TMDL				
Near dam also LCMAU – A2 101314	ADEQ TMDL				
Between Newman and Railroad canyons LCMAU – C 102252	ADEQ TMDL				

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	6.5 µg/L at 46 mg/L hardness A&Wc acute	05/02/2002 – 10 μg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring. (See note below concerning lab detection limits)
Dissolved oxygen	7.0 mg/L A&Wc	08/13/2003 - 5.9 mg/L 09/08/2004 - 6.1 mg/L	Inconclusive – Low dissolved oxygen in 2 of 6 sampling events.
Mercury (dissolved)	0.01 μg/L A&Ww chronic	09/08/2004 – 0.0185 μg/L	Inconclusive – Only 1 exceedance during the assessment period.
Nickel (dissolved)	18.8 µg/L at 30 mg/L hardness A&Wc chronic	03/24/2004 – 20 μg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.
Nickel	140 μg/L DWS	03/24/2004 – 790 μg/L	Inconclusive – Only 1 exceedance in 3 sampling events.
Zinc (dissolved)	50.5 μg/L at 37 mg/L hardness	08/13/2003 – 80 μg/L	Inconclusive – Only 1 exceedance during the last 3 years of monitoring.

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS Copper, dissolved oxygen, nickel, zinc Insufficient dissolved metals (cadmium, copper, and zinc), and E. coli bacteria to assess A&Wc and FBC.		MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
			The lab detection limits (for at least 1 sample) for dissolved metals (cadmium, copper, lead, mercury, and silver) were higher than the chronic A&W criteria.	
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: 1. Mercury fish consumption advisory issued in 2002 remains in effect; and 2. A TMDL should be completed and approved in 2007.		
MONITORING RECOMMENDATIONS		High Priority – Collect mercury samples to support completion of the mercury TMDL. Collect additional copper, dissolved oxygen, nickel and zinc samples du to the exceedances. Low dissolved oxygen may indicate excess nutrient loading. New methods for implementing the narrative nutrient standars should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring. Collect sufficient core parameters to represent at least 3 seasons.		
		Use lower lab detection limits for dissolved metals.		

LEE VALLEY CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Lee Valley Reservoir 15020001-232A 1.6 Miles Unique Water	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 06/19/2001 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Above Lee Valley Reservoir LCLVL001.32 101243	ADEQ Ambient	I total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, chromium, mercury, nickel, selenium, silver, thallium, and zinc I total metals only: Cadmium, copper, lead, and silver	1 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solid: 1 Turbidity

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENT
No Exceedances	DESIGNATED USES		

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	Lab detection limits for selenium and dissolved mercury were higher than A&Wo chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Collect missing core parameters to represent at least 3 seasons during an assessment period.	
		Use lower lab detection I	imits for selenium and dissolved mercury.

LEE VALLEY RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT	
15020001-0770 35 Acres	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining Agi Attaining AgL Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE				
DATABASE #					
		Metals	Nutrients - Related	Other	
At dam LCLEE - A 101356	ADEQ Ambient	3 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, chromium,	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total	3 Fluoride 3 Total dissolved solids 3 Turbidity	
Shoreline LCLEE – SH 101357	ADEQ Ambient (<i>E. coli</i> only)	mercury, nickel, selenium, silver, thallium, and zinc 3 total metals only: Cadmium, copper, lead, and silver	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Nitrogen	1.10 mg/L A&Wc and FBC	04/02/2002 – 1.58 mg/L 06/12/2002 – 1.85 mg/L	Inconclusive – Exceeded criteria in 2 of 3 samples. (Requires a minimum of 5 exceedances and 20 samples to assess as impaired.)
Dissolved oxygen	7.0 mg/L A&Wc	06/28/2000 - 6.7 mg/L 08/14/2000 - 6.5 mg/L 08/13/2003 - 5.8 mg/L	Attaining – Field notes indicate that low dissolved oxygen is due to natural conditions of ground water upwelling.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Nitrogen	Insufficient dissolved metals (cadmium, copper) and E. coli bacteria to assess A&W and FBC.		Lab detection limits for dissolved metals (cadmium, copper, mercury, and silver) were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		exceedances. Elevated nit methods for implementin applied to this lake once nutrient violations are occ	t additional nitrogen samples due to the rogen may indicate excess nutrient loading. New g the narrative nutrient standard should be adopted, to determine whether narrative curring. The ters to represent at least 3 seasons during an

LITTLE COLORADO RIVER From West Fork Little Colorado	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
River to Water Canyon 15020001 011 19.8 Miles	A&Wc – Impaired FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Suspended sediment (turbidity)	A turbidity TMDL was approved in 2002. Implementing strategies to reduce sediment loading. (See discussion in reach 15020001-009)

MONITORING US		SESSMENT				
SITE NAMES	AGENCY	SAMPLING PERIOD: 06/20/2000 – 09/12/2001 NUMBER AND TYPES OF SAMPLES				
ID#	PURPOSE					
DATABASE #		Metals	Nutrients - Related	Other		
County Road 4036 (X Diamond Ranch) LCLCR352.03 102279	ADEQ TMDL	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead,	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 37 Turbidity		
County Road pull out LCLCR350.73 102283	Volunteers 319 Project and ADEQ TMDL	mercury, nickel, silver, thallium, and zinc 4 total and 0-2 dissolved: Boron and manganese	Kjeldahl nitrogen 19 Dissolved oxygen, pH			
Below South Fork LCR LCLCR350.32 100581	ADEQ Ambient					
Highway 273 bridge LCLCR346.01 102281	ADEQ TMDL					
Schoolhouse Road LCLCR344.58 102284	ADEQ TMDL					
At Water Canyon bridge LCLCR343.72 102282	ADEQ . TMDL					

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	6/27/2001 – 6.5 mg/L	Attaining – Only 1 exceedance in 19 samples (binomial).

DATA GAPS AND MC	NITORING NE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMEN	IDATIONS	implementation strategies. criteria (10 NTU). Recomm	ne effectiveness monitoring for TMDL 13 of 37 turbidity samples exceeded the old nend using biocriteria assessments and bottom rocedures in this reach, when they are adopted.

LITTLE COLORADO RIVER	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From Water Canyon to Nutrioso Creek 15020001 010 3.8 Miles	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 4A Not attaining (Impaired)	Suspended sediment (turbidity)	A turbidity TMDL was approved in 2002. Implementing strategies to reduce loading. (See discussion in reach 15020001-009)

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 06/21/2000 – 12/02/2002				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients – Related	Other		
Springerville – 4th Street LCLCR343.58 102286	ADEQ TMDL	None	30 Dissolved oxygen, 30 pH	30 Turbidity		
Springerville – River Street LCLCR343.18 102292	ADEQ TMDL					
Airport road weir LCLCR341.63 102285	ADEQ TMDL					
Above Highway 60 bridge LCLCR340.65 100333	Volunteers 319 Project ADEQ TMDL					
Diversion near Springerville LCLCR339.28 102291	ADEQ TMDL					
At golf course LCLCR302.98 103274	Volunteers 319 Project					

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	10/16/2001 – 6.4 mg/L	Attaining – Only 1 exceedance in 30 samples

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MO	DNITORING NEED	S	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Missing core parameters		Lab detection limit for selenium was higher than A&Wc chronic criteria.
MONITORING RECOMMEN	IDATIONS	implementation strategies. the old criteria (10 NTU).	ue effectiveness monitoring for TMDL Note that 14 of 30 turbidity samples exceeded Recommend using biocriteria assessments and station procedures in this reach, when they are

LITTLE COLORADO RIVER	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From Nutrioso Creek to Carnero Creek 15020001 009 12.1 Miles	A&Wc - Impaired FBC - Attaining FC - Attaining Agl - Attaining AgL - Attaining	Category 4A Not attaining (Impaired)	Suspended sediment (turbidity)	A turbidity TMDL was approved in 2002. Implementing strategies to reduce loading. See discussion below.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/29/2000 – 06/09/2005				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Below Springerville WWTP LCLCR340.02 100331	ADEQ and USGS Ambient	7-24 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel,	23-24 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total	21 E. coli bacteria 22 Fluoride 21 Total dissolved solids 12 Suspended sediment		
Casa Malpais across from Becker Lake LCLCR339.28 102287	ADEQ TMDL	silver, thallium, and zinc 24 total and 0-1 dissolved: Boron, manganese	Kjeldahl nitrogen, dissolved oxygen, pH	concentration 42 Turbidity		
At Weinema Bridge LCLCR336.76 102567	AGFD Ambient					
At Weinema Wildlife area on Hooper Road LCLCR336.72 102290	ADEQ TMDL					
Canyon off Highway 180 LCLCR334.96 102324	ADEQ TMDL					
Road crossing on H-180 LCLCR331.83 102288	ADEQ TMDL					
At Carnero Creek LCLCR328.04 102289	ADEQ TMDL					

EXCEEDANCE	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	08/15/2000 – 260 CFU/100 ml	Attaining – No exceedances in the last 3 years of monitoring. (Note, only marginally over criteria and not above the screening value.)
pН	<9.0 SU A&Wc, FBC, AgI, AgL	06/10/2003 - 9.4 SU	Attaining – Only 1 exceedance in 24 sampling events. (Binomial)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	04/02/2003 – 111 mg/L	Attaining – This exceedance could not be included in the geometric mean calculation because it occurred during a high flow event. Geometric mean was not exceeded. However, the old turbidity standard (10 NTU was exceeded in 35 of the 42 measurements taken.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for selenium was higher than A&Wc chronic criteria.
DISCUSSION OF TURBIDITY	IMPAIRMENT	insufficient data collected determine whether the str This reach was originally liturbidity standard was rep (SSC) criterion in 2002. As exceeded in this reach; ho exceeded in 35 of 42 field Several proposals in the 20	sted as impaired by turbidity; however, the laced by a suspended sediment concentration noted above, the SSC standard has not been wever, the old turbidity criterion of 10 NTU was samples. 206 Triennial Review of surface water quality
	DATIONS	determining impairment, s A. Biocriteria imple B. Narrative botto C. Revision of the Once adopted, these proc	ementation procedures, m deposits implementation procedures, SSC criterion. edures may be applied to this reach.
MONITORING RECOMMEN	DATIONS		e effectiveness monitoring for TMDL Recommend using biocriteria assessments and ntation procedures in this reach, when they are

LITTLE COLORADO RIVER From unnamed reach (15020001-	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
021) to Lyman Lake 15020001 005 3.4 Miles	A&Wc – Impaired FBC – Inconclusive FC – Attaining AgI – Attaining AgL – Attaining	Category 4A Not attaining (Impaired)	Suspended sediment	TMDL approved in 2002 for two reaches upstream. Placed on Category 4 in 2004 due to exceedances. (See discussion in reach 15020001-009)

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 11/14/2000 – 08/07/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above Lyman Lake USGS #09384000 LCLCR323.60 101174	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron and manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 3 Turbidity	

EXCEEDAN	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml	08/07/2001 – 354 CFU/100 ml	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
E. coli bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.	
MONITORING RECOMMENDATIONS		implementation strategies, samples. Recommend using implementation procedure the old turbidity criterion (and 481 NTU). Collect additional <i>E. coli</i> be	the effectiveness monitoring for TMDL Collect suspended sediment concentration g biocriteria assessments and bottom deposits s in this reach, when they are adopted Note that (10 NTU) was exceeded in 3 of 4 samples (18, 24, acteria due to the exceedance. Inits for selenium and dissolved mercury.	

LITTLE COLORADO RIVER	USE	SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From Silver Creek to Carr Wash 15020002- 004 6.1 Miles	A D E Q	A&Wc - Impaired FBC - Impaired FC - Inconclusive DWS - Inconclusive AgI - Attaining AgL - Attaining	Category 5	E. coli bacteria, suspended sediment concentration	Added E. coli bacteria in 2004. ADEQ adds suspended sediment concentration.
	E P A	FBC – Impaired (Affected uses only)	Category 5 Impaired	Suspended sediment	EPA listed sediment in 2004

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Note that ADEQ is currently also listing this reach as impaired due to suspended sediment concentration.

SITE NAMES AGEN		SAMPLING PERIOD: 03/27/2000 – 06/07/2005			
ID#	PURPOSE	NUMBER AND TYPES OF SAMPLES			
DATABASE #		Metals	Nutrients - Related	Other	
Near Woodruff, AZ USGS #09394500 LCLCR226.31 100334	ADEQ and USGS Ambient	14-18 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, zinc 6-8 total and dissolved metals: Barium, nickel, silver, thallium 18 total metals only: Boron, manganese	17-18 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	16 E. coli bacteria 18 Fluoride 13 Total dissolved solids 9 Suspended sediment concentration 16 Turbidity	

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT	
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS	
Arsenic 50 μ g/L DWS and FBC		08/14/2000 – 67 μg/L	Attaining – Only 1 exceedance in 18 samples. (Binomial)	
Barium	2000 μg/L DWS	08/14/2000 – 7700 μg/L 08/06/2001 – 3400 μg/L	Inconclusive – 2 exceedances in 8 samples. (Binomial) Exceedances occurred during monsoon flood events.	
Beryllium 4 µg/L DWS		08/14/2000 – 43 μg/L 08/06/2001 – 13 μg/L	Inconclusive – 2 exceedances in 8 samples. (Binomial) Exceedances occurred during monsoon flood events.	
Chromium 100 µg/L DWS and FBC		08/14/2000 – 120 μg/L	Attaining – Only 1 exceedance in 17 samples. (Binomial)	
Dissolved oxygen	7.0 mg/L A&Wc	08/06/2001 – 6.3 mg/L 08/07/2003 – 6.3 mg/L 08/12/2003 – 6.0 mg/L	Attaining – Only 3 of 17 samples did not meet standards. (Binomial)	
E. coli bacteria	235 CFU/100 ml	08/14/2000 – 57000 CFU/100 ml 08/06/2001 – 1800 CFU/100 ml 08/07/2003 – 833 CFU/100 ml	Remains impaired -Only 1 of 7 samples exceeded the criterion in the last 3 years of monitoring (3 in the assessment period).	
Lead	15 μg/L – FBC and DWS 100 μg/L – AgL	08/14/2000 – 290 μg/L 05/21/2001 – 19 μg/L 08/06/2001 – 110 μg/L 08/12/2003 – 16 μg/L	Inconclusive – 4 of 18 samples exceeded the 15 μ g/L criterion. (Binomial requires a minimum of 5 exceedances and 20 samples.) (EPA is likely to add this to 303(d) List.)	
Manganese	980 μg/L DWs	08/14/2000 – 9800 μg/L 08/06/2001 – 3300 μg/L	Attaining – Only 2 of 18 samples exceeded criterion. (Binomial)	
Mercury	0.6 μg/L FC	05/21/2001 – 0.61	Attaining – Only 1 exceedance in 18 samples. (Binomial) (Only slightly above the criterion)	
Nickel	140 μg/L DWS	08/14/2000 – 210 μg/L	Inconclusive – Only 1 exceedance in 8 samples (Binomial)	
Suspended sediment concentration	Geometric mean 80 mg/L	10/01/2002 – 98 mg/L 04/01/2003 – 107 mg/L 08/07/2003 – 563 mg/L	Impaired – 5 of 9 samples exceeded criterion. No elevated flows (0.2 to 18 cfs). Geometric mean of 4 samples exceeded 80 mg/L 5 times.	

(SSC)	09/24/2003 - 101 mg/L	Note that the old turbidity standard (10 NTU) was
	07/07/2004 - 119 mg/L	also exceeded in all 16 samples.

DATA GAPS AND MO	DNITORING NE	EDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Barium, beryllium, lead, nickel	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.	
DISCUSSION OF IMPAIRMENT DUE TO SUSPENDED SEDIMENT CONCENTRATION		EPA originally listed sediment in 2004. In the current assessment, ADEQ has sufficient evidence to also list this reach as impaired by suspended sediment based on 5 exceedances of geometric mean standard.		
MONITORING RECOMMENDATIONS		High Priority – Collect additional <i>E. coli</i> and sediment samples to support TMDL development. Recommend using biocriteria assessments and botton deposits implementation procedures in this reach, when they are adopted Collect additional barium, beryllium, lead and nickel samples due to the exceedances.		
			nits for selenium and dissolved mercury.	

LITTLE COLORADO RIVER From Porter Tank Draw to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
McDonalds Wash 15020008 017 17.4 Miles	A&Wc - Impaired FBC - Inconclusive FC - Inconclusive DWS - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 5	Copper, silver and suspended sediment	Copper and silver on 303(d) List since 1992. Added suspended sediment in 2004.

SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING PERIOD: 06/20/2000 – 09/23/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Near Joseph City, AZ USGS #09397300 LCLCR206.75 101480	USGS Ambient	None	None	30 Suspended sediment (7-day averages)

EXCEEDAN		T = 1 ====	
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	Too many to list out here.	Remains impaired –Exceeded during all 30 of 7-day aggregation periods. Concentrations ranged from 107-130,000 mg/L and the average concentration was 57,835 mg/L. Some measurements occurred during elevated flows, and would be excluded from the geometric mean calculation, but not all values.

DATA GAPS AND MC	MITORING NEEL		
EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Missing all core parameters needed to assess designated uses.		
MONITORING RECOMMENDATIONS		High Priority – Collect additional sediment, copper, and silver samples to support TMDL development. Recommend using biocriteria assessments and bottom deposits implementation procedures in this reach, when they are adopted	
		Collect core parameters to period.	represent at least 3 seasons during the assessment

LONG LAKE (LOWER)		USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
15020008 0820 320 Acres	A D E Q	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive		
	E P A	FC – Impaired (Affected use only)	Category 5 Impaired	Mercury in fish tissue	EPA listed mercury in 2004 due to mercury fish consumption advisory. Regional mercury TMDL to be completed in 2006.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/17/2000 – 07/13/2004					
DATABASE #		NUMBER AND TYPES OF SAMP	NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other			
At Dam LCLLL - A 101715	ADEQ Ambient	8 total and 7 dissolved: Mercury 3-4 total and dissolved: Cadmium,	3-6 sample: Ammonia, total nitrogen, nitrite/nitrate, total	1 <i>E. coli</i> bacteria 5 Fluoride 6 Total dissolved solids			
Shoreline LCLLL - SHORE 100999	ADEQ Ambient (algae only)	chromium, copper, lead, nickel, selenium, silver, thallium, and zinc 4 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron, manganese, selenium, silver, thallium	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Turbidity			
North Cove LCLLL – NC 102760	AGFD Ambient						
South Cove LCLLL – SC 102555	AGFD Ambient						

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
рН	<9.0 SU A&Wc FBC, Agl, AgL	08/07/2003 - 9.8 SU 07/03/2003 - 9.5 SU	Inconclusive – 2 of 8 samples exceeded the criterion. (Binomial method requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

Pollutant: Assume "total" concentration, unless shown as dissolved.

DATA GAPS AND MO	ONITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
pH	Missing E. coli bacteria to assess FBC.		Lab detection limits for dissolved metals (copper, lead, mercury, selenium, and silver) and total selenium were higher than applicable criteria for at least 1 sample.
DISCUSSION OF MERCURY	IMPAIRMENT	effect; and	rcury impairment: onsumption advisory issued in 2003 remains in cury TMDL should be completed in 2007.

MONITORING RECOMMENDATIONS	High Priority –Collect mercury samples to support TMDL development. Collect additional pH measurements due to the exceedance. Collect
	sufficient E. coli bacteria to represent at least 3 seasons. Use lower lab
>	detection limits for dissolved metals and selenium.
	Elevated pH may indicate excess nutrient loading. New methods for
	implementing the narrative nutrient standard should be applied to this
	lake once adopted, to determine whether narrative nutrient violations are
	occurring.

LYMAN RESERVOIR	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
15020001-0850 1310 Acres	A D E Q	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining Agl Attaining AgL Attaining	Category 2 Attaining Some Uses		
	E P A	FC – Impaired (Affected use only)	Category 5	Mercury in fish tissue	EPA listed mercury in 2004 due to mercury fish consumption advisory.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 04/20/200				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At dam LCLYM - A 101841	ADEQ Ambient	8 total and 2 dissolved: Mercury 5-6 total and dissolved metals: Cadmium, chromium, copper,	6 samples: Ammonia, total nitrogen, nitrite/nitrate, total	6 Fluoride 6 Total dissolved solids		
Mid Lake LCLYM – B 101842	ADEQ Ambient	lead, nickel, silver, and zinc 6 total metals only: Antimony, arsenic, barium, beryllium, manganese, mercury, selenium, and thallium (3-4 samples per site)	phosphorus, total Kjeldahl nitrogen, pH 4 samples: Dissolved oxygen			

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/17/2004 – 6.5	Inconclusive – On this one date, there was insufficient dissolved oxygen at one meter but adequate levels at 0.5 and 0.1 meters.

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Dissolved oxygen.	Insufficient <i>E. coli</i> bacteria to assess FBC.			
DISCUSSION OF MERCURY	IMPAIRMENT	Evidence of potential mercury impairment: Mercury fish consumption advisory issued in 2004 remains in effect.		
MONITORING RECOMMENDATIONS		Collect dissolved oxygen san standard (10 NTU) was exce NTU). Low dissolved oxygen nutrient loading. New methostandard should be applied to narrative nutrient violations	any data to support TMDL development. In ples due to the exceedance. The old turbidity eded in all 3 sampling events (87, 97, and 155 in and high turbidity may be symptoms of excess ods for implementing the narrative nutrient to this lake once adopted, to determine whether are occurring. Iters to represent at least 3 seasons.	

MINERAL CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Concho Creek 15020002-648 25.8 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/15/2000 - 08/07/2001		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Forest Road #404 LCMIN018.05 100593	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron and manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 0 Suspended sediment concentration 4 Turbidity

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	05/01/2001 – 6.4 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. Low nutrient concentrations (0.26 mg/L nitrogen, 0.09 mg/L phosphorus).

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower la mercury.	b detection limits for selenium and dissolved

NELSON RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT	
15020001 1000 65 Acres	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 04/20/2004 – 8/18/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At dam LCNEL - A 101840	ADEQ Ambient	2 total and 1-2 dissolved metals: Cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc 2 total metals only: Antimony, arsenic, barium, beryllium, manganese, selenium, and thallium	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH 4 samples: Dissolved oxygen	O <i>E. coli</i> bacteria 6 Fluoride 6 Total dissolved solids 0 Suspended sediment concentration 0 Turbidity		

EXCEEDANCE			
POLLUTANT	STANDARD UNIT DESIGNATED USES	EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/17/2004 – 6.2	Inconclusive – There was insufficient dissolved oxygen at one meter but adequate concentrations at 0.5 and 0.1 meters. Insufficient sampling events.

DATA GAPS AND MC	DNITORING NEED	S	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen	Insufficient samples to assess any designated uses	Insufficient sampling events	
MONITORING RECOMMENDATIONS		low dissolved oxygen. Low of nutrient loading. New methor standard should be applied to narrative nutrient violations oxygen.	ditional dissolved oxygen samples due to the dissolved oxygen may be a symptom of excess ods for implementing the narrative nutrient o this lake once adopted, to determine whether are occurring due to the one low dissolved
		Collect missing core paramet assessment period.	ers to represent at least 3 seasons during the

NEWMAN CANYON	USE SUPPORT	OVERALL ASSESSMENT	
I I I I I I I I I I I I I I I I I I I	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3	

MONITORING U	SED IN THI	S ASSESSMENT		
SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 9/10/2003	- 04/07/2005	
DATABASE #	TABASE # NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other
Near Upper Lake Mary inlet LCNWC000.10 102369	ADEQ TMDL	4 total and 4 dissolved: Mercury 2 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, thallium, and zinc.	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen. 4: dissolved oxygen, pH	4 Fluoride 3 Total dissolved solids 3 Turbidity

EXCEEDANCE:	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Mercury (dissolved)	0.01 µg/L A&Wc chronic	09/10/2003 – 0.016 μg/L	Inconclusive Only 1 exceedance during the assessment period

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Insufficient core parameters	Insufficient sampling events	Lab detection limits for dissolved cadmium, copper, lead, and silver were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Collect missing core para assessment period. Use lo Note that the old turbidi samples collected. Collect Recommend using biocri	t mercury samples due to the exceedance. meters to represent at least 3 seasons during an ower lab detection limits for dissolved metals. ty criterion (10 NTU) was exceeded in all 3 ct suspended sediment concentration data. teria assessments and bottom deposits res in this reach, when they are adopted

NUTRIOSO CREEK	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From headwaters to Nelson Reservoir 15020001-017A 13.3 Miles (New reach split at Nelson Reservoir)	A&Wc – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining all uses		Delist turbidity / suspended sediment. See discussion below.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/14/2000 – 11/02/2005 (Ambient monitoring 11/08/2000 – 08/30/2001)					
DATABASE #	PURPUSE	NUMBER AND TYPES OF SAMPLES					
UNINDAJE #		Metals Nutrients – Related Other					
At weir LCNUT026.83 102008	ADEQ TMDL	4 total and 4 dissolved: Mercury 4 total and dissolved metals:	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total	4 E. coli bacteria 4 Fluoride 10 Total dissolved solids 26 Suspended sediment concentration 26 Turbidity			
Co Rd 2015 Bridge LCNUT023.45 102003	ADEQ TMDL	Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver,	phosphorus, total Kjeldahl nitrogen 12 Dissolved oxygen				
Hwy 180 Bridge LCNUT023.17 102002	ADEQ TMDL	thallium, and zinc 4 total metals only: Boron,	12 pH				
At Jenson property LCNUT022.30 102001	ADEQ TMDL	manganese, mercury					
At cemetery before bridge LCNUT021.75 102000	ADEQ TMDL						
At EC Bar Ranch LCNUT020.85 102112	ADEQ TMDL						
Crosswhite reference site LCNUT020.72 101998	ADEQ TMDL						
Near Nutrioso, AZ LCNUT020.23 100936	ADEQ Ambient						
Near EC Bar Ranch LCNUT019.07 102011	ADEQ TMDL						
At old corral LCNUT017.61 101994	ADEQ TMDL						
Near Private Drive LCNUT016.85 101993	ADEQ TMDL						
Upstream of Nelson Res LCNUT015.61 100344	ADEQ TMDL						

EXCEEDANCE	.3		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/12/2001 – 5.1 mg/L 08/30/2001 – 6.5 mg/L 06/10/2004 – 4.2 mg/L	Attaining – At least one exceedance was due to natural conditions of low flow and ground water upwelling (flow 0.1 cfs). Only 2 other exceedances in 12 samples (binomial).

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
DELISTING CRITERIA FOR TO IMPAIRMENT	URBIDITY	turbidity standard was repl (SSC) criterion in 2002. Tu from this reach as the SSC s Watershed improvements	iginally listed as impaired by turbidity, the aced by a suspended sediment concentration rbidity / suspended sediment is to be delisted standard has not been exceeded with 26 samples projects have also been completed in this reach at loadings from grazing activities.
MONITORING RECOMMENDATIONS		Medium Priority -Continue implementation strategies.	e effectiveness monitoring for TMDL Recommend using biocriteria assessments and tation procedures in this reach, when they are

NUTRIOSO CREEK From Nelson Reservoir to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Picnic Creek 15020001-017B 13.3 Miles	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 4A Not attaining (Impaired)	Suspended sediment (turbidity)	A suspended sediment TMDL was approved in 2002.

MONITORING U	SED IN THI				
SITE NAMES	AGENCY	SAMPLING PERIOD: 01/14/2000 – 11/02/2005			
ID#	PURPOSE	(Ambient monitoring 11/08/200			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Below Nelson Reservoir LCNUT013.33 101722	ADEQ TMDL	1 total and 1 dissolved: Mercury	4 Dissolved oxygen 4 pH	1 <i>E. coli</i> bacteria 4 Suspended sediment concentration 2 Turbidity	
Highway 180 milepost 407 LCNUT011.29 101988	ADEQ TMDL				
Near Molina Basin LCNUT009.31 101982	ADEQ TMDL				

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters		
MONITORING RECOMMEN	IDATIONS	implementation strategies. bottom deposits implemen adopted. Insufficient susper determine whether standar Collect missing core param assessment period.	e effectiveness monitoring for TMDL Recommend using biocriteria assessments and tation procedures in this reach, when they are nded sediment concentration data in this reach to rds are currently being met. eters to represent at least 3 seasons during an nits for selenium and dissolved mercury.

From Picnic Creek to Little	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Colorado River 15020001 015	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 4A Not attaining (Impaired)	Suspended sediment (turbidity)	Suspended sediment TMDL was approved in 2002.

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 01/14/2000 – 11/02/2005 (Ambient monitoring 11/08/2000 – 08/30/2001)		
DATABASE #	FORFOSE	NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
No current data Older data collected for sites: 102010 and 104318				Remains impaired until suspended sediment concentration or other data indicates standards are being attained.

PORTER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Show Low Creek 15020005 246 4.4 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 10/23/2002 – 06/11/2003				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Above Scott Reservoir LCPRT002.28 101415	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, mercury, and zinc 3-4 total metals only: Boron, lead, and manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, and pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	06/11/2003 - 4.6 mg/L	Attaining – Low dissolved oxygen due to low flow and ground water upwelling. Flow was only 0.01 cfs.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and some o the dissolved copper samples were higher than A&Wc chronic criteria.
MONITORING RECOMMEN	IDATIONS	Low Priority –Use a lower copper.	lab detection limit for selenium and dissolved

RAILROAD CANYON	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Upper Lake Mary 15020015 204 5.4 Miles	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/09/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Near Upper Lake Mary inlet LCRRC000.05 102370	ADEQ TMDL	1 total and dissolved metals: Chromium, mercury, nickel, and zinc 1 total metals only: Antimony, arsenic, barium, beryllium, boron cadmium, copper, lead, manganese, selenium, silver, and thallium.	1 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Fluoride 1 Total dissolved solids 1 Turbidity		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	Lab detection limits for dissolved metals (cadmium, copper, lead and silver) were higher than A&Wc chronic criteria.
MONITORING RECOMMEN	DATIONS	seasons during an assessm	sing core parameters to represent at least 3 nent period.

RAINBOW LAKE 15020005 1170	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
110 Acres	A&Wc – Impaired FBC – Impaired FC – Attaining Agl – Impaired AgL – Impaired	Category 4A Not attaining (Impaired)	Narrative nutrient and pH	A narrative nutrient TMDL was approved in 2000 due to low dissolved, high pH, excess weeds, and occasional fish kills. Implementing strategies to reduce nutrient loading.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATES: 06/13/2002; 08/19/2004; 05/24/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At dam LCRAI - A 100069	ADEQ Ambient	4 total and dissolved metals: Cadmium, chromium, copper, lead, nickel, selenium, and	4-5 samples: Ammonia, total nitrogen, nitrite/nitrate, total	7 E. coli bacteria 4 Fluoride 4 Total dissolved solide	
Mid lake LCRAI - B 100070	ADEQ Ambient	zinc 4 total and 0-1 dissolved: Antimony, arsenic, barium, beryllium, boron, manganese, mercury, silver, thallium	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/19/2004 - 6.0 mg/L (both sites)	Remains impaired – Exceedances in 1 of 3 sampling events. (Binomial)
pH (high)	<9.0 SU	08/19/2004 - 9.4 SU 06/13/2004 - 9.24 SU	Remains impaired – Exceeded criterion on 2 of 3 sampling events (4 of 5 samples). (Binomial)

DATA GAPS AND MO			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
,	Collected all core parameters		Lab detection limit for selenium was higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority -Continue implementation strategies t	e monitoring to determine effectiveness of to reduce loadings.
		New methods for impleme applied to this lake once as violations are occurring.	enting the narrative nutrient standard should be dopted, to determine whether narrative nutrient

RIO DE FLAG	USE SUPPORT	OVERALL ASSESSMENT
From Flagstaff WWTP discharge to San Francisco Wash 15020015 – 004B 3.7 Miles	A&Wedw – Attaining PBC – Attaining	Category 1 Attaining all uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 12/21/200			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Below Doney Park LCRDF002.11 101127	ADEQ Ambient	4-5 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron and manganese	4 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEEDS	5	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wedw chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use a lowe mercury.	r lab detection limit for selenium and dissolved
		(Note: A site specific Aquapplies to this reach.)	atic and Wildlife copper standard of 36 μg/L

RIVER RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT	
15020001-1220 140 Acres	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 04/17/20	001 – 10/18/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Mid Lake LCRIV - B 102556	AGFD Ambient	3 total metals: Copper, lead, manganese, and zinc	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH 4 samples: Dissolved oxygen	3 Total dissolved solids		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Missing dissolved metals (cadmium, copper, and zinc), mercury, <i>E. coli</i> bacteria, boron, manganese, and lead to assess designated uses.		
MONITORING RECOMMEN	DATIONS	Low Priority – Collect missin seasons during the assessmen	g core parameters to represent at least 3 at period.

SHOW LOW CREEK	USE SUPPORT	OVERALL ASSESSMENT	
41.7 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/15/200		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Near Show Low, AZ USGS #09390500 LCSHL021.46 100340	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron and manganese	4 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 3 Turbidity

EXCEEDANCES				
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS	
Dissolved oxygen	7.0 mg/L A&Wc	08/06/2001 – 5.0 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling (Flow was 0.5 cfs)	

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.	
MONITORING RECOMMENDATIONS		Low Priority – Use a lower lab detection limit for selenium and dissolved mercury.		
		and 57). Recommend coll Recommend using biocrit	d of 10 NTU was exceeded all 3 samples (15.25) lecting suspended sediment concentration data. eria assessments and bottom deposits es in this reach, when they are adopted	

SILVER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Show Low Creek 15020005 – 013 33.6 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE				
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Below AGFD hatchery LCSIL043.84 101125	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 4 total metals only: Boron and manganese	4 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity	

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/07/2001 – 6.4 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling. Low nutrients (nitrogen 0.4 and phosphorus 0.096 mg/L)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.	
MONITORING RECOMMENDATIONS		The old turbidity standard (19.4). Recommend collect Recommend using biocriti	er lab detection limit for selenium and dissolved d of 10 NTU was exceeded in 1 of 4 samples cting suspended sediment concentration data. eria assessments and bottom deposits es in this reach, when they are adopted	

SILVER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Sevenmile Draw to Little Colorado River 15020005 – 001 9.3 Miles	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive Agl - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES AGENC		SAMPLING PERIOD: 10/22/200	2 - 01/28/2003		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
250 Feet below USGS gage Below USGS #09393500 LCS1L013.65 100337	ADEQ Ambient	2 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, and zinc 1-2 total metals only: Boron, lead, manganese, mercury	2 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 E. coli bacteria 2 Fluoride 2 Total dissolved solids 1 Suspended sediment concentration 2 Turbidity	

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	Lab detection limit for selenium was higher that A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		seasons. Use a lower lab detection The old turbidity standard and 23 NTU). Recommendusing by	limit for selenium. d of 10 NTU was exceeded in both samples (136 and collecting suspended sediment concentration piocriteria assessments and bottom deposits res in this reach, when they are adopted

SOLDIER'S ANNEX LAKE	U	JSE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
15020008 1430 120 Acres	A D FI	&Wc - Inconclusive BC - Inconclusive C - Inconclusive sgl - Inconclusive ugL - Inconclusive	Category 3 Inconclusive		
		C – Impaired Affected use only)	Category 5 Impaired	Mercury in fish tissue	The regional mercury is scheduled for completion in 2006.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 09/18/2001				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At Dam LCSAL - A 103354	AGFD Ambient	None	1 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH			

POLLUTANT	STANDARD UNIT	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances	DESIGNATED USES		

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	
DISCUSSION OF MERCURY	IMPAIRMENT	effect; and	rcury impairment: consumption advisory issued in 2003 remains in cury TMDL should be approved in 2007.
MONITORING RECOMMENDATIONS		High Priority –Collect mercury samples to support TMDL development. Collect core parameters to represent at least 3 seasons during the assessment period.	

SOLDIER'S LAKE 15020008 1440	USE	SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
28 Acres	A D E Q	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgI - Attaining AgL - Attaining	Category 2 Attaining Some Uses		
	E P A	FC – Impaired (Affected use only)	Category 5 Impaired	Mercury in fish tissue	The regional mercury is scheduled for completion in 2006.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES AGENCY ID # PURPOSE DATABASE #		SAMPLING PERIOD: 05/29/2003 – 04/12/2005		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Mid lake LCSOI -A 101733	ADEQ and AGFD Ambient	3-4 total and dissolved metals: Chromium, mercury, nickel, selenium, and zinc 4 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium, copper, lead, manganese, selenium, silver, thallium	4-5 sample: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 Fluoride 5 Total dissolved solids 2 Turbidity

EXCEEDANCES				
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS	
Dissolved oxygen	7.0 mg/L A&Wc	07/02/2003 - 6.2 mg/L 07/13/2003 - 6.7 mg/L	Inconclusive – Low dissolved oxygen in 2 of 5 sampling events. (Binomial requires a minimum of 5 exceedances and 20 samples to assess as impaired.)	

Pollutant: Assume "total" concentration, unless shown as dissolved.

DATA GAPS AND MC	NITORING NEEDS			
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient <i>E. coli</i> bacteria, dissolved copper, and dissolved cadmium to assess FBC and A&Wc		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, selenium, and silver) were higher than applicable criteria for at least 1 sample.	
DISCUSSION OF MERCURY IMPAIRMENT		Evidence of potential mercury impairment: 1. Mercury fish consumption advisory issued in 2003 remains in effect; and 2. A regional mercury TMDL should be approved in 2007.		
MONITORING RECOMMENDATIONS		High Priority -Collect mer Collect additional dissolve Low dissolved oxygen ma methods for implementing applied to this lake once a nutrient violations are occ	rcury samples to support TMDL development. ed oxygen measurements due to the exceedance. by be a symptom of excess nutrient loading. New g the narrative nutrient standard should be adopted, to determine whether narrative curring. neters to represent at least 3 seasons. Use lower	

TUNNEL RESERVOIR	USE SUPPORT	OVERALL ASSESSMENT	
15020001-1550 40 Acres	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Inconclusive	Category 3	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 04/17/200	1 – 10/17/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Mid Lake LCTUN - B 102568	AGFD Ambient	3 total metals: Copper, lead, and zinc 2 total metals: Manganese	2-3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH 4 samples: Dissolved oxygen	3 Total dissolved solids		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/17/2004 – 3.7 mg/L	Inconclusive – Only 1 exceedance out of 2 samples. (Binomial)
Nitrogen	1.1 mg/L A&Wc and FBC	07/25/2001 – 1.1 mg/L	Inconclusive – Only 1 exceedance in 3 samples. (Binomial) Note that nitrogen was also elevated but not exceeding the standard (at 0.91 mg/L) on 10/17/2001.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEED	S	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and nitrogen	Missing dissolved metals, mercury, E. coli bacteria, boron, manganese, and lead to assess designated uses.		
MONITORING RECOMMEN	DATIONS	to exceedances. Low dissol excess nutrient loading to t narrative nutrient standard determine whether narrativ	low dissolved oxygen and nitrogen samples due wed oxygen and high nitrogen may indicate this lake. New methods for implementing the should be applied to this lake once adopted, to we nutrient violations are occurring.
		assessment period.	eters to represent at least 3 seasons during the

WEST FORK LITTLE COLORADO RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Government Springs 15020001-013A 9.1 Miles	A&Wc - Attaining FBC - Attaining FC - Inconclusive	Category 2 Attaining some uses	

MONITORING U	SED IN THI	S ASSESSMENT				
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/07/2000 – 06/16/2003				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Below Sheep's Crossing LCWLR004.09 100945	ADEQ Ambient	3-7 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 7 total and 0 dissolved: Boron and manganese	6-7 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	7 E. coli bacteria 7 Fluoride 7 Total dissolved solids 3 Suspended sediment concentration 7 Turbidity		

EXCEEDANCES					
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS		
Mercury	0.6 μg/L FC	10/23/2002 – 0.64 μg/L	Inconclusive – Only 1 exceedance in 7 samples. (Binomial)		

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Mercury	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS			additional mercury data due to the exceedance nits for selenium and dissolved mercury.

WEST FORK LITTLE COLORADO RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Government Springs to Little Colorado River 15020001-013B 2.2 Miles	A&Wc - Inconclusive FBC - Attaining FC - Attaining AgL - Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/30/2000 – 06/08/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
At Government Springs LCWLR000.92 100328	ADEQ Ambient	7-21 total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, silver, thallium, and zinc 21 total metals only: Boron, manganese 20 total and 12 dissolved: Mercury	20-21 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	21 <i>E. coli</i> bacteria 21 Fluoride 18 Total dissolved solids 12 Suspended sediment concentration 21 Turbidity

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	4.9 µg/L at 29 mg/L hardness 3.2 µg/L at 22 mg/L hardness A&Wc acute	03/20/2002 – 13 μg/L 12/29/2004 – 22 μg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring (2 during the assessment period). However, the total copper analysis on both dates indicated that total copper was <10 mg/L. Because the dissolved copper should not exceed the total copper by more than 10%, these values alone are not reliable enough to determine impairment. No anthropomorphic sources of copper in the watershed.
Dissolved oxygen	7.0 mg/L A&Wc	06/28/2000 – 6.7 mg/L 08/14/2000 – 6.5 mg/L 08/13/2003 – 5.8 mg/L	Attaining – Low dissolved oxygen is due to natural conditions of ground water upwelling.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Copper	Collected all core parameters		Lab detection limits for selenium and dissolved metals (cadmium, copper, lead, mercury, and zinc) were higher than A&Wc chronic criteria in 4-22 samples.	
MONITORING RECOMMENDATIONS		Medium Priority – Collect additional copper samples due to the exceedances. Use lower lab detection limits for selenium and dissolved metals.		

WILLOW SPRINGS LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15020010-1670 160 Acres	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 02/22/2002 – 07/15/2004 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
At dam LCWIS - A 100091	AGFD and ADEQ Ambient	1-2 total and 0-2 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	3-5 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH, dissolved oxygen	1 <i>E. coli</i> bacteria 2 Fluoride 5 Total dissolved solids 2 Turbidity

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	07/16/2002 – 6.2 mg/L 08/08/2003 – 6.6 mg/L	Inconclusive – Low dissolved oxygen in 2 of 4 sampling events. (Binomial method requires a minimum of 5 exceedances and 20 samples to determine impairment.)
Selenium	2.0 μg/L A&Wc chronic	08/08/2003 – 6.0 μg/L	Inconclusive – Only 1 exceedance in last 3 years of monitoring.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and selenium Insufficient core parameters		Insufficient sampling events	Lab detection limits for dissolved metals (cadmium, copper, mercury, and silver) were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		samples due to the exceedan nutrients. New methods for should be applied to this lake nutrient violations are occurr	Iditional dissolved oxygen and selenium ces. Low dissolved oxygen may indicate excess implementing the narrative nutrient standard e once adopted, to determine whether narrative ring. ers to represent at least 3 seasons during the
		Use lower lab detection limit	s for dissolved metals.

WOODS CANYON LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15020010-1700 70 Acres	A&Wc - Inconclusive FBC - Attaining FC - Attaining DWS - Attaining AgI - Attaining AgL - Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIODS: 10/19/2000 –11/02/2004			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At dam LCWCL - A 100092	AGFD and ADEQ Ambient	4-6 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	11-16 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, pH, dissolved oxygen	3 <i>E. coli</i> bacteria 7 Fluoride 16 Total dissolved solids 11 Turbidity	
Mid lake LCWCL – B 100093	ADEQ Ambient				
At boat ramp LCWCL – BR 101324	ADEQ Ambient (bacteria only)				

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&W/c	07/16/2002 – 6.2 mg/L 10/28/2002 – 6.2 mg/L 07/23/2003 – 6.6 mg/L 10/20/2003 – 5.9 mg/L 08/19/2004 – 5.5 mg/L	Inconclusive – Low dissolved oxygen in 5 of 13 sampling events (5 of 16 samples). (Binomial method requires a minimum of 5 exceedances and 20 samples to list as impaired.) (EPA is likely to add this to the 303(d) List.)
pH	>6.5 SU A&Wc, FBC, AgL	10/19/2000 - 6.38 SU	Attaining – Only 1 low pH in 13 sampling events (1 of 16 samples) (Binomial).

DATA GAPS AND MC	NITORING NEED	S	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved oxygen and pH	Insufficient dissolved copper, cadmium, and zinc needed to assess A&Wc		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, and silver) and total selenium were higher than A&Wc chronic criteria in one or more sample.
MONITORING RECOMMEN	DATIONS	exceedances. Low dissolved New methods for implement	additional dissolved oxygen due to the doxygen may indicate excess nutrient loadings, enting the narrative nutrient standard should be dopted, to determine whether narrative nutrient
		Collect missing core param assessment period.	eters to represent at least 3 seasons during the
		Use lower lab detection lin	nits for dissolved metals and selenium.

Middle Gila Watershed

Watershed Description

This watershed encompasses the Gila River drainage area below Coolidge Dam (San Carlos Reservoir) in the east to Painted Rock Dam in the west. It excludes the Santa Cruz River, the San Pedro River, and the Salt River drainage above Granite Reef Dam. The Salt River drainage area below Granite Reef Dam is included in this watershed (instead of the Salt Watershed) because the canals and diversions at the dam hydrologically disconnect the system from the rest of the Salt drainage.

The Phoenix metropolitan area, located in this 12,250 square mile watershed, consists of more than three million people (2000 census) and continues to be one of the fastest growing areas in the United States. Land ownership in the Middle Gila is approximately: 65% federal land, 25% private land, 4% state land, and 4% tribal land. Within the metropolitan area, irrigated agriculture uses are rapidly being displaced by urbanization. Outside the urbanized area, livestock grazing is the primary land use. Mining (primarily now abandoned) has occurred across this watershed, with more concentration south of Prescott.

Elevations range from 7,400 feet (above sea level) to 1,100 feet at Painted Rocks Reservoir. Most of the watershed is below 5,000 feet in elevation, with Sonoran Desert flora and fauna and warmwater aquatic communities.

Water Resources

This area receives little rainfall (approximately 13 inches a year); therefore, surface water flow is primarily attributed to releases from upstream impoundments, effluent from wastewater treatment plants, and agricultural return flows.

An estimate of surface water resources in the Middle Gila Watershed is provided in **Table X.** Waters on Indian lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Table X. Estimated Surface Water Resources in the Middle Gila Watershed

Excluding Indian Lands

	Perennial	Intermittent	Ephemeral
Stream miles	165	1,210	5,460
	Perennial	Non-perennial	
Lake acres	10,320	6,830	

On Indian Lands - Not Assessed

	Perennial	Intermittent	Ephemeral
Stream miles On Indian Lands	0	10	1,105
	Perennial	Non-perennial	
Lake acres On Indian Lands	240	0	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Map of watershed showing:

Generalized topography
Highways
Cities
National Forests, Monuments, Refuges
HUCs (the subdivisions by number)

Watershed Partnerships

- Tres Rios River Management Group
 The area of interest is delineated approximately by the Salt River and Gila River drainage in the
 Phoenix Metropolitan area between Southern (north), Baseline (south), 83rd Avenue (east) and Agua
 Fria River (west). This group works on water issues such as pollutants, flood flows, agriculture
 stormwater runoff, agriculture irrigation and dewatering, concentrated animal feeding operation
 discharges, wastewater treatment plant discharges, landfill leachate, ground water inflow, sand and
 gravel area releases, and degradation of wildlife habitat. There are quarterly meetings at the Flood
 Control District offices in Phoenix. Contact Debbi Radford, City of Phoenix at (602) 262-1828 or
 debbi.radford@phoenix.gov.
- Upper Agua Fria Watershed Partnership
 The area of interest is the Agua Fria River drainage, excluding the area in the Prescott Active
 Management Area (AMA) or the Phoenix AMA. This group works on water quality and quantity issues such as growth, ranching and grazing, leaking underground storage tanks, illegal dumping, and water rights. They meet at Arcosanti on the 1st Tuesday of the month. For more information, contact Mary Hoadley at (928) 632-7135 or earthhous@aol.com.
- Southwest Strategy Water Task Team
 A pilot project is located on the Upper Agua Fria drainage area. Federal, tribal, state, and local entities are identifying and prioritizing water resource concerns in this area to provide coordinated and effective actions. Meetings occur as needed. Contact Mary Reece, (602) 206-3884 or mreece @lc.usbr.gov.

Special Studies and Water Quality Improvement Projects

The following studies and water quality improvement projects have occurred in the Middle Gila Watershed during the last 5 years.

Total Maximum Daily Load Analyses – The following TMDL analyses have been completed, are ongoing, or are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL, if completed, can be obtained at ADEQ's website: www.azdeq.gov.

- Alvord Park Lake in south Phoenix is impaired due to ammonia.
 Elevated ammonia may represent a risk to aquatic life. This lake is an important urban recreational area. The TMDL investigation is scheduled to be initiated in 2007.
- Chaparral Lake in Scottsdale is impaired due to low dissolved oxygen and bacteria (Escherichia coli).
 Swimming or wading in the lake is prohibited; therefore, public health risk due to the presence of E. coli is reduced. Low dissolved oxygen may pose problems for aquatic life. Both low dissolved oxygen and high E. coli are likely related to ducks and other wildlife that congregate at this lake.
 Both TMDLs are scheduled to be initiated in 2007.
- Cortez Park Lake in Phoenix is impaired due to low dissolved oxygen and high pH
 Low dissolved oxygen and high pH are frequently associated with excess nutrient loadings and
 eutrophic conditions which may lead to algal blooms and even fish kills. The narrative nutrient
 implementation guidance being developed by ADEQ may be used in developing these TMDLs as
 numeric nutrient standards have not been established. Both TMDLs are scheduled to be initiated in
 2007.
- French Gulch, a tributary to the Hassayampa River near Walnut Grove, is impaired due to cadmium, copper, and zinc.
 Metal concentrations may represent a risk to aquatic and wildlife communities. TMDLs were completed and for this stream in 2005 and identified the Zonia Mine as the primary source of these

pollutants, although natural background and other inactive and abandoned mine workings may also be contributing loads. Currently the mine is operating three production wells to draw down the ground water table and reduce metal loading to the surface water from the ground water. ADEQ will be working with the owners of Zonia Mine and other stakeholders to develop and implement management measures to further reduce loadings and pollutant risks to the environment.

- Hassayampa River is impaired due to cadmium, copper and zinc.
 Metal concentrations may pose a risk to aquatic and wildlife communities. TMDLs were approved in 2002. Several abandoned mine tailings were identified as primary sources of these contaminants including: McCleur tailings, Senator Gold Mine adit and tailings, and the Wetland tailings. The U.S. Forest Service has initiated several remediation projects, and ADEQ is working with interested stakeholders to prepare a TMDL Implementation Plan to identify other actions and watershed management measures.
- Several reaches of the Gila River, Painted Rocks Reservoir, and the Salt River and the
 Hassayamapa River reaches that flow into the Gila River are all impaired by pesticides in fish tissue
 specifically, DDT metabolites, toxaphene, and chlordane. (See also Painted Rocks Borrow Pit in
 the Colorado Lower Gila Watershed.)
 Although these pesticides have been banned from use for at least 20 years, these pesticides remain
 at concentrations that may pose a high risk to aquatic life and species that prey on them, including
 humans who may eat the fish. Fish consumption advisories have been set for these waters for more
 than 10 years. This is a complex TMDL due to the size of the drainage and vast area where these
 pesticides were historically applied.
- Mineral Creek, at tributary to the Gila River near Kelvin, is impaired due to copper and selenium.
 Both copper and selenium concentrations may pose a risk to aquatic life and wildlife. Recent remediation efforts have been effective in mitigated copper contamination, as exceedances only occur during extreme flow events; however, those methods have not reduced the selenium loads.
- Queen Creek near Superior is impaired due to copper.
 Copper concentrations may pose a risk to aquatic life and wildlife. A TMDL was initiated in 2005 and is scheduled to be completed in 2007.
- Turkey Creek, a tributary to the Agua Fria, is impaired due to copper and lead. Metals concentrations may represent a risk to aquatic life and wildlife. TMDLs, anticipated to be completed in 2006, indicate that the primary sources of metals are inactive and abandoned mines, such as Golden Turkey Mine and Golden Belt Mine. ADEQ has been coordinating with the U.S. Forest Service in identifying remediation actions for mines on Forest Service land. ADEQ has been working with stakeholders to identify and implement strategies or actions that would bring Turkey Creek back into compliance with its standards.

Water Quality Improvement Grant Projects — ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

- Bar S Ranch Septic System Project
 Bar S Ranch (2001)
 Replace a failing septic system to protect Chicken Springs Wash, at Mingus Mountain.
- Algal Bioreactor Filtration Project
 Universal Entech, LLC (2002)
 Develop and demonstrate an algal biological filtration system to treat agricultural runoff waters from irrigation drainage ditches prior to entering the Gila River. The goal was to reduce nutrient loading (including Painted Rocks Borrow Pit downstream).

Upper Hassayampa River Watershed Restoration Project

Maughan Ranches (2003)

Exclude cattle from riparian areas along the Hassayampa River (from Milk Creek to Hassayampa River Canyon Wilderness Area) in an effort to increase riparian vegetation, stabilize soil, and reduce

Upper Agua Fria Wildcat Dumpsite Cleanup Project

Upper Agua Fria Watershed Partnership (2004)

Clean up illegal dump sites along Big Bug Creek, a tributary to the Agua Fria River. Sites were located along Big Bug Creek between Cordes Junction and Mayer.

Gibson Mine Remediation Project

Franciscan Friars of California (2005 and 2006)

Design, construct, and implement a manmade wetland to reduce copper, beryllium, zinc, and turbidity loadings to Pinto Creek and Mineral Creek.

Water Protection Fund Projects - The following Water Protection Fund Projects were awarded by the Arizona Department of Water Resources. More information about these funds or projects can be obtained from the ADWR web site at: http://www.azwater.gov.

Tres Alamos Ranch Tank Rehabilitation Project

Tres Alamos Ranch (2000)

Exclude grazing from 35 acres near Wickenburg, decommission three cattle tanks (replanting the dirt tanks area with native plants), and replace dirt tanks at 2 other sites with cattle drinkers.

Papago Park Green Line Project

The city of Tempe and the Arizona Historical Society (2000)

Obtain water rights to sustain a riparian area. The project would also restore and regenerate riparian health and provide educational opportunities for the public.

Lynx Creek Restoration Project

Prescott National Forest (2003)

Restore a segment of Lynx Creek, including two wetland areas.

U.S. Army Corps of Engineers' Ecosystem Restoration Projects – Ecosystem restoration, environmental stewardship, and radioactive site cleanup projects are funded through the annual federal Energy and Water budget. The purpose of ecosystem restoration is to re-establish attributes of a natural functioning and self-regulating system.

Va Shly 'ay Akimel

Restore riparian ecosystem using native vegetation along the Salt River between Granite Reef Dam to the Interstate 101 Bridge (14 miles and 17,435 acres). The project will establish a functional floodplain in the unconstrained reaches. To provide passive recreational opportunities, improved habitat, and provide educational opportunities.

Rio Salado - Tempe Reach

Restore threatened and endangered species habitat by planting mesquite, cottonwood-willow, wetland, strand scrub, and open edge habitat along the Salt River between McClintock Avenue and Priest Drive, and from McKellips road to Tempe Town Lake.

Rio Salado – Phoenix Reach

Restore riparian habitat along the Salt River from Interstate 10 Bridge to 19th Avenue (5 miles and 580 acres). A series of shallow pools will be connected by a perennially flowing stream. Three parking areas will be added for public access to the restored area.

Rio Salado Oeste

The objective is to increase the functional riparian along the Salt River, between 19th Avenue and 83rd Avenue. To attract wetland and riparian avian species, and establish the presence of amphibians, reptiles, mammals and birds, while suppressing undesirable fish and wildlife speices and invasive plants. The project is to increase passive recreational and educational opportunities and reduce flood damage.

Tres Rios

Provide sustainable and diverse native riparian habitat in the Tres Rios area, which is along the Salt River and Gila River from 83rd Avenue to the Agua Fria River (9.2 miles and 5,600 acres). The project should also reduce flood damages and increase environmental education and recreation opportunities.

Tres Rios del Norte

This project is located along the Santa Cruz River between Prince Road to Sanders Road, West Moore Road and West Avra Valley Road. It will restore 19 miles of wetland and riparian vegetative communities along the Santa Cruz River and its adjacent floodplains. The restoration would vastly improve mesquite, cottonwood-willow, and emergent wetland habitats to a condition supportive of wildlife, and for the benefit of residents and visitors to the area.

Other Water Quality Studies

Phoenix Metropolitan Reservoir Study

David Walker, University of Arizona

This is an ongoing and comprehensive study of water quality in reservoirs serving the Phoenix metropolitan area. Goal is to collect and analyze data to answer water quality management questions in a proactive manner. A yearly report is produced. In 2005, the report provided information about: climate and drought effects on water quality, wildfire effects on water quality, harmful algal blooms, atmospheric deposition and the use of sediment to look at accumulation of pollutants, and endocrine disruption compounds.

Hydrologic Characteristics of the Agua Fria National Monument, Central Arizona, Determined from the Reconnaissance Study

John B. Fleming, U.S. Geological Survey, in cooperation with the Bureau of Land Management A characterization of the hydrologic conditions in the newly created Agua Fria National Monument based on existing hydrologic and geologic information and stream flow data collected in 2002.

Tres Rios Constructed Wetlands Project

City of Phoenix and Corps of Engineers

The Tres Rios Constructed Wetlands demonstrates the practicality and usefulness of constructed wetlands in reclaiming wastewater effluent while establishing wildlife habitat in arid regions.

Determination of Channel Change for Selected Streams, Maricopa County, Arizona

Joseph P. Capesium and Ted W. Leham – U.S. Geological Survey in cooperation with the Flood Control

District of Manicopa County (2002)

Alluvial stream channels in arid regions are dynamic and channel changes can occur over short time periods, ranging from hours to weeks. A channel can scour during higher discharges and fill during lower discharges, causing short-term changes. In Maricopa County, 10 sites on seven streams were studied to determine the lateral and vertical change of channel. All channels showed some change in cross-section area or hydraulic radius, but the direction and magnitude of change varied considerably some are more dynamic than others. Long-term channel change (years to decades) was also studied as this would have more effect on potential flood-hazards. Three sites appeared to have substantial longterm channel change.

Chapter II – Middle Gila Watershed MG - 6

- Reconnaissance of the Upper Aqua Fria Watershed and Hydrologic Analysis
 Loyd O. Barnett, Richard H. Hawkins, and D. Phillip Guertin, School of Renewable Natural Resources,
 University of Arizona, in cooperation with the Upper Agua Fria Watershed Partnership
 This report provides a description of the watershed characteristics, including hydrology and watershed
 issues. The report primarily focuses on water quantity and water rights, with a brief summary of water
 quality concerns. The report established strategies to address the water budget, water rights, watershed
 health, and water quality concerns.
- Status of Federal and State Listed Warm Water Fishes of the Gila River Basin, with Recommendations for Management

Desert Fishes Team Report Number 1 (2003)

This report reviews the status of 12 federal and state listed native warm water fishes in the Gila River basin and the post 1967 recovery and conservation actions taken by all agencies, organizations, or parties.

• Assessment of Selected Inorganic Constituents in Streams in the Central Arizona Basins Study Area, Arizona and Northern Mexico, through 1998

David Anning – U.S. Geological Survey, National Water Quality Assessment Program (2003) Inorganic chemical data (dissolved solids, suspended sediment, and nutrients) and stream properties (temperature, pH, dissolved oxygen) were analyzed to assess water quality, determine natural and human factors affecting water quality, and compute stream loads.

Assessments

The Middle Gila Watershed can be separated into the following drainage areas (subwatersheds):

15050100 Gila – Queen Creek Drainage Area (from San Carlos Reservoir to Salt River)
 15060106B Salt – Cave Creek Drainage Area (from Granite Reef Dam to Gila River)
 15070101 Gila – Painted Rock Drainage Area (from Salt River to Painted Rock Dam)
 15070102 Agua Fria River Drainage Area
 15070103 Hassayampa River Drainage Area
 15070104 Centennial River Drainage Area

These drainage areas and the surface waters assessed as "attaining" or "impaired" are illustrated on the following watershed map. Methods used to complete these assessments are described in the "Surface Water Assessment Methods and Technical Support" document (2006).

Assessment Map	

AGUA FRIA RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From State Route 169 to Yarber Wash 15070102 – 031B 17.8 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining DWS – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/26/2002	2 – 05/22/2003	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Below USGS gage #09512450 MGAFR109.37 101672	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, and zinc 4 total and 0-1 dissolved: Boron, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity

EXCEEDANCES				
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS	
No Exceedances				

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium and dissolved mercury	

AGUA FRIA RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Sycamore Creek to Big Bug Creek 15070102 023 9.1 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining DWS – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/21/2001 – 09/20/2002 NUMBER AND TYPES OF SAMPLES			
DATABASE #					
		Metals	Nutrients - Related	Other	
Below USGS gage #09512500 MGAFR087.06 100710	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, and zinc 4 total metals only: Boron, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solid: 4 Turbidity	

POLLUTANT	STANDARD UNIT	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances	DESIGNATED USES		

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Collected all core		Lab detection limit for selenium was higher
	parameters	A17.	than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium.	

AGUA FRIA RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Little Squaw Creek to Cottonwood Creek 15070102 – 017 5.8 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining DWS Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining	

SITE NAMES ID#	AGENCY PURPOSE	SAMPLING PERIOD: 11/21/2001 – 09/20/2002				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Below Rock Springs USGS gage #09512800 MGAFR053.33 101304	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, boron, cadmium, chromium, copper, and zinc 4 total metals only: Boron, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity		

EXCEEDANC	.E3		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	11/21/2001 – 1.7 mg/L 05/08/2002 – 4.1 mg/L	Attaining – Low dissolved oxygen due to groundwater upwelling and low flow. (Flow 0.01-0.05 cfs). Very low nutrient loads (0.03-0.1 mg/L nitrogen, 0.08-0.09 mg/L phosphorus).

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters	Š.	Lab detection limit for selenium was higher than A&Ww chronic criteria.
MONITORING RECOMMEN	DATIONS	Low Priority – Use a lower	lab detection limit for selenium.

ALVORD LAKE 15060106B 0050	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
27 ACRES	A&Ww – Impaired PBC – Inconclusive FC – Inconclusive	Category 5	Ammonia	Added ammonia to 303(d) List in 2004.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/21/2000 – 01/24/2005				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Inflow MGALV-A 101040	AGFD Ambient	2 total and 3 dissolved: Cadmium, chromium, copper, lead, manganese, mercury and zinc	11-21 samples: Ammonia, total nitrogen, nitrite/nitrate, total	2 Fluoride 12 Total dissolved solids 6 Turbidity		
Boat ramp MCALV-BR 102752	AGFD Ambient	2 total and 0-2 dissolved metals: Antimony, arsenic, beryllium, boron, lead, and selenium	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH			
Mid lake MGALV-C 101042	AGFD Ambient					
Combined site A, B, C MCALV-ABC 101053	AGFD Ambient					
East basin MGALV-EAST 102562	AGFD Ambient					
West lagoon MBALV-WEST 102563	AGFD Ambient					

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Ammonia	0.29 mg/L at 24.8 C, 8.9 SU 0.32 mg/L at 28.1 C, 8.7 SU 0.74 mg/L at 21.6 C, 8.3 SU A&Ww chronic	05/09/2001 – 0.33 mg/L 09/17/2002 – 1.09 mg/L 05/01/2003 – 1.33 mg/L	Remains impaired -3 exceedances during the assessment period.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
_	Insufficient <i>E. coli</i> bacteria and mercury to assess FBC and FC		Lab detection limit for dissolved mercury is higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		High Priority - Collect ammonia samples to support development of ammonia TMDL. High ammonia may be a symptom of excess nutrient loading. New methods for implementing the narrative nutrient standar should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring.	
		Use lower lab detection limit Collect missing core paramete assessment period.	for dissolved mercury. ers to represent at least 3 seasons during the

ARNETT CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Queen Creek 15050100 – 1818 11.1 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining	Category 1 Attaining	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 12/19/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
At Blue Springs MGARN007.64 103462	Resolution Copper Ambient	4-8 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, and	4-6 samples: Ammonia, total nitrogen, nitrite/nitrate, total	6 <i>E. coli</i> bacteria 6 Fluoride 6 Total dissolved solids	
Near Superior, AZ MCARN002.74 101306	ADEQ Ambient	zinc 4-8 total and 0-2 dissolved: Boron, lead, mercury, silver	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	6 Turbidity 1 Cyanide	

EXCEEDANCES				
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS	
Dissolved oxygen	6.0 mg/L A&Ww	08/26/2002 - 5.3 mg/L 05/07/2002 - 3.4 mg/L	Attaining – Low dissolved oxygen due to groundwater upwelling and low flow. (Flow 0.01 cfs)	

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&WW chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower la mercury.	b detection limits for selenium and dissolved

BLUE JOHN WASH	USE SUPPORT	OVERALL ASSESSMENT
From headwaters to unnamed tributary of Lynx Creek 15070102 471 1.0 Miles	A&We - Inconclusive PBC - Inconclusive	Category 3 Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 05/11/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Upstream of unnamed tributary to Lynx Creek (Sheldon Mine wash) MGBLJ000.06 103409	Weston Inc Special inv for EPA	I dissolved metal sample: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, thallium, and zinc	None	1 Fluoride 1 Total dissolved solid:	

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Zinc (dissolved)	3,599.4 µg/L at >400 mg/L hardness A&Wc acute	05/11/2001 – 5060 μg/L	Inconclusive – Only 1 exceedance.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Zinc	Insufficient core parameters	Insufficient monitoring events	Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMEN	IDATIONS	Use lower lab detection li Collect core parameters to assessment period.	additional zinc data due to the exceedance. mits for selenium and dissolved mercury. prepresent at least 3 seasons during an tary to Lynx Creek" assessment)

CASH MINE CREEK From headwaters to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Hassayampa River 15070103 349 1 Mile	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive	Category 4A Not attaining (Impaired)	Cadmium, copper, zinc	The Hassayampa River TMDL included loadings for cadmium, copper, and zinc from this tributary.

SITE NAMES ID #	AGENCY PURPOSE					
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Near McCleur Tailings MGCSM000.34 102818	ADEQ TMDL and Westin, Inc Special Inv.	2 total and 3 dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, silver, and zinc	2 Dissolved oxygen 2 pH	1 Fluoride 1 Total dissolved solids		
Below road MGCSM000.29 100833	ADEQ TMDL	2 total and -0-2 dissolved: Barium, boron, manganese, mercury				

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	21.5 µg/L at 165 mg/L hardness 9.2 µg/L at 67 mg/L hardness A&Wc acute	05/10/2001 – 2820 μg/L 03/04/2005 – 1700 μg/L	Remains impaired – 2 exceedances in last 3 years of monitoring. Also considered the magnitude of the values and the mining sources in the area.
pH	>6.5 SU A&Wc, FBC	03/04/2005 – 5.8 μg/L	Inconclusive – 1 of 2 samples did not meet the criteria (binomial).
Lead (dissolved)	4.7 μg/L at 165 mg/L hardness A&Wc chronic	05/10/2001 – 7.1 μg/L	Inconclusive – 1 exceedance during the assessment period.
Zinc (dissolved)	193 µg/L at 165 mg/L hardness 83.5 µg/L at 67 mg/L hardness A&Wc acute	05/10/2001 – 256 μg/L 03/04/2005 – 120 μg/L	Remains impaired – 2 exceedances in the last 3 years of monitoring.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead and pH	Insufficient dissolved oxygen, E. coli bacteria, and mercury to assess A&Wc, FBC, and FC.	Insufficient monitoring events	Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria.
to assess A&Wc, FBC, and FC. MONITORING RECOMMENDATIONS		evaluate the effectiveness of have been implemented. So conditions – conditions in v Collect additional lead sam Collect additional core para	admium, copper, zinc, and pH data to of TMDL implementation strategies after they amples collected should represent critical which exceedances are most likely to occur. uples due to the exceedance. ameters to represent at least 3 seasons. hits for selenium and dissolved mercury.

Draft February 2007

Publication Number: EQR 07-02

UNNAMED TRIBUTARY TO CASH MINE CREEK	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From headwaters to Cash Mine Creek 15070103 415 1 Mile	A&Wc – Impaired FBC – Inconclusive FC – Inconclusive	Category 4A Not attaining (Impaired)	Cadmium, copper, zinc	The Hassayampa River TMDL included loadings for cadmium, copper, and zinc from this tributary.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATES: 05/10/2001; and 03/04/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above adit & McCleur tailings MGUCM000.27 103357	Westin, Inc Special Inv.	4-5 total and dissolved metals: Antimony, arsenic, barlum, beryllium, cadmium, chromium, copper, lead, mercury, manganese, nickel, silver, thallium, and zinc 1 total and dissolved: Boron 1 Selenium (Only 2 sampling events)	2 Dissolved oxygen 2 pH	4 Fluoride 4 Total dissolved solids	
At adit & above McCleur tailings MGUCM000.25 103358	Westin, Inc Special Inv.				
Below adit & above McCleur tailings MGUCM000.22 103359	Westin, Inc Special Inv.				
Above McCleur tailings MGUCM000.13 102816	ADEQ TMDL				
At base of McCleur tailings MGUCM000.09 103352	Westin, Inc Special Inv.				
Below McCleur tailings MGUCM000.01 102817	ADEQ TMDL		·		

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Beryllium	5.3 μg/L A&Wc chronic	05/10/2001 – 6.2 μg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.
Cadmium (dissolved)	5.7 µg/L at 130 mg/L hardness 2.9 µg/L at 70 mg/L hardness A&Wc acute	05/10/2001 – 82.1 μg/L 03/04/2005 – 13.0 μg/L	Remains impaired – 2 exceedances in the last 3 years of monitoring.
Copper (dissolved)	17.2 µg/L at 130 mg/L hardness 9.6 µg/L at 70 mg/L hardness A&Wc acute	05/10/2001 – 1080 μg/L 03/04/2005 – 150 μg/L	Remains impaired – 2 exceedances in last 3 years of monitoring.
Lead	15 µg/L FBC	05/10/2001 – 60.6 μg/L	Inconclusive – Only 1 exceedance in 2 samples. (Binomial)
Lead (dissolved)	3.3 µg/L at 130 mg/L hardness A&Wc chronic	05/10/2001 – 60.6 μg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring.
pH	>6.5 SU A&Wc, FBC	03/04/2005 - 5.4 SU	Inconclusive -Did not meet standard when measured - only 1 measurement taken. (Binomial)
Selenium	2.0 µg/L A&Wc chronic	05/10/2001 – 3.7 μg/L	Inconclusive – Exceeded in only 1 sample during the last 3 years of monitoring.
Zinc (dissolved)	156 μg/L at 130 mg/L hardness 86.6 μg/L at 70 mg/L hardness A&Wc acute	05/10/2001 – 7590 μg/L 03/04/2005 – 1400 μg/L	Remains impaired – 2 exceedances in the last 3 years of monitoring.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Beryllium, lead, pH, and selenium	Insufficient dissolved oxygen and <i>E. coli</i> bacteria to assess attainment of A&W or FBC.	Insufficient monitoring events	Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		data to evaluate the effer after they have been im conditions – when excelled Collect additional beryll exceedances. Collect additional core page 1.	ct additional cadmium, copper, zinc, and pH ectiveness of TMDL implementation strategies plemented. Collect these samples during critical edances are most likely to occur. ium, lead, and selenium samples due to parameters to represent at least 3 seasons. limits for selenium and dissolved mercury.

CAVE CREEK	USE SUPPORT	OVERALL ASSESSMENT	
THE	A&Ww - Attaining FBC - Attaining FC - Attaining AgL - Attaining	Category 1 Attaining	

MONITORING L	ISED IN THI	S ASSESSMENT			
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 12/17/2001			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
Below Seven Springs MGCVE037.68 100527	ADEQ Ambient	5-8 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, and	8 samples: Ammonia, total nitrogen, nitrite/nitrate, total	8 <i>E. coli</i> bacteria 8 Fluoride 8 Total dissolved solids	
Below Maricopa Mine tailings MCCVE025.98 101305	ADEQ Ambient	zinc 4-8 total and 0-2 dissolved: Boron, lead, manganese, mercury	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Suspended sediment concentration 8 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	NITORING NEED!	5	•
EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Collected all core		Lab detection limit for selenium was higher
	parameters		than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Use lower lab detection limits for selenium.	

CHAPARRAL PARK LAKE	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
12 Acres	A&Ww – Impaired PBC – Impaired FC – Inconclusive AgI – Inconclusive	Category 5	E. coli bacteria and low dissolved oxygen	E. coli bacteria and low dissolved oxygen were added to 303(d) list in 2004.

SITE NAMES AGENCY ID # PURPOSE DATABASE #		SAMPLING PERIOD: 05/09/2001 – 10/31/2003 NUMBER AND TYPES OF SAMPLES			
At dam MGCHA-A 101045	ADEQ Ambient	2 total and 3 dissolved: Barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, zinc	7 samples: Ammonia, total nitrogen, nitrite/nitrate, total	2 Fluoride 5 Total dissolved solids 1 Turbidity	
Mid Lake MGCHA-B 101046	ADEQ Ambient	2 total and 0-2 dissolved: Antimony, arsenic, beryllium, boron, selenium, and silver	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances	e -		

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MO	NITORING NEED	S		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient dissolved oxygen, <i>E. coli</i> bacteria, manganese, boron and mercury to assess uses.		Lab detection limit for dissolved mercury was higher than A&Ww chronic criteria.	
DISSOLVED OXYGEN AND PH IMPAIRMENT		Insufficient data to affect impairment decisions. No bacteria data. Delisting dissolved oxygen would require at least 10 samples, some of which were collected during critical conditions.		
MONITORING RECOMMENDATIONS		development of TMDLs. La excess nutrient loading. Ne	olved oxygen and <i>E. coli</i> bacteria to support ow dissolved oxygen may be an indication of w methods for implementing the narrative applied to this lake once adopted, to determine violations are occurring.	
		Collect missing core param assessment period.	eters to represent at least 3 seasons during an	
		Use lower lab detection lin	nits for dissolved mercury.	

CORTEZ PARK LAKE 15060106B – 0410	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
2 Acres	A&Ww – Impaired PBC – Impaired FC – Inconclusive AgI – Impaired	Category 5	High pH and low dissolved oxygen	High pH and low dissolved oxygen were added to 303(d) list in 2004.

SITE NAMES ID#	AGENCY PURPOSE	SAMPLING PERIOD: 05/14/2001 – 09/24/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At dam MGCOR - A 101043	ADEQ Ambient	2 total and 2 dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead,	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total	2 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solids		
Mid Lake MGCOR - B 101044	AGFD Ambient	manganese, mercury, nickel, selenium, silver, zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 Turbidity		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient core parameters	Insufficient sampling events	Lab detection limit for dissolved mercury was higher than A&Ww chronic criteria.
MONITORING RECOMMEN	DATIONS	development of TMDLs. Low symptoms of excess nutrient narrative nutrient standard sl determine whether narrative	ved oxygen and pH samples to support vidissolved oxygen and high pH may be loading. New methods for implementing the should be applied to this lake once adopted, to instrict violations are occurring. There is to represent at least 3 seasons during an acts for dissolved mercury.

ENCANTO PARK LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15060106B- 0510 8 Acres	A&Ww – Inconclusive PBC – Inconclusive FC – Inconclusive Agl – Inconclusive	Category 3 Inconclusive	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 07/23/2002 – 10/01/2003			
DATABASE #		NUMBER AND TYPES OF SA	NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other	
Mid lake MGENC - B 102757	ADEQ Ambient	Idissolved only: Cadmium, chromium, copper, lead, manganese, mercury, and zinc	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen	2 Total dissolved solids	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	Lab detection limits for selenium and dissolved mercury were higher than A&Ww.
MONITORING RECOMMENDATIONS		Low Priority – Collect missing core parameters to represent at least 3 season during the assessment period.	
		Use lower lab detection limit	ts for selenium and dissolved mercury.

FAIN LAKE	USE SUPPORT	OVERALL ASSESSMENT	
1015 Acres	A&Ww - Inconclusive FBC - Attaining FC - Inconclusive	Category 2 Attaining	
		some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 08/29/2002 – 06/09/2004			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At dam MGFAI-A 101400	ADEQ Ambient	2 total and 2 dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc	2-3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 2 Fluoride 3 Total dissolved solids 2 Turbidity	

EXCEEDANCES					
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS		
Dissolved oxygen	6.0 mg/L A&Ww	08/29/2002 – 4.3	Inconclusive – Only 1 exceedance in 3 sampling events (binomial).		

MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Insufficient dissolved copper, cadmium, mercury, and zinc to assess A&Ww and FC.	Samples only represent 1 season (June and August).	Lab detection limit for dissolved mercury was higher than A&Ww chronic criteria.
DATIONS	met. Low dissolved oxygen New methods for implemen applied to this lake once ad- violations are occurring.	issolved oxygen data because criterion was not may be a symptom of excess nutrient loading, iting the narrative nutrient standard should be opted, to determine whether narrative nutrient
	assessment period.	ters to represent at least 3 seasons during the
	Insufficient dissolved copper, cadmium, mercury, and zinc to assess A&Ww and FC.	Insufficient dissolved copper, cadmium, mercury, and zinc to assess A&Ww and FC. DATIONS Samples only represent 1 season (June and August). Medium Priority – Collect d met. Low dissolved oxygen New methods for implement applied to this lake once adviolations are occurring. Collect missing core parame

FRENCH GULCH From headwaters to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Hassayampa River 15070103 239 9.8 Miles	A&Ww – Impaired FBC – Inconclusive FC – Attaining	Category 4A Not attaining (Impaired)	Cadmium, copper, and zinc	TMDL completed and approved in 2004 for cadmium, copper, and zinc

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/29/	2001 – 04/03/2004			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Below headwaters MGFRG010.33 102234	ADEQ TMDL	36-45 total and dissolved: Cadmium, chromium, copper, and zinc 43 total and 4 dissolved: Manganese 36-38 total and 0-2 dissolved: Arsenic, boron, lead, mercury 3 total and dissolved: Beryllium 38 pH	19 Dissolved oxygen	None		
Western trib above Zonia Mine MGFRG010.19 102085	ADEQ TMDL					
Above Zonia Mine MGFRG010.14 102088	ADEQ TMDL					
At headwaters MGFRG010.13 102086	ADEQ TMDL					
Above Zonia Mine MGFRG009.79 101619	ADEQ TMDL					
Below upper waste rock pile MGFRG009.59 102087	ADEQ TMDL					
Above Zonia Gulch MGFRG008.19 102235	ADEQ TMDL					
Below Zonia Gulch MGFRG008.09 101620	ADEQ TMDL					
Above Placerita Gulch MGFRG007.28 102242	ADEQ TMDL					
Above Placerita Gulch MGFRG007.06 101649	ADEQ TMDL					
Below Placerita Gulch MGFRG0006.95 101650	ADEQ TMDL					
Above Hassayampa River MGFRG000.19 102084	ADEQ TMDL					

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L FBC	11/12/2003 – 78 μg/L	Attaining – Only 1 exceedance in 38 samples (binomial).
Cadmium (dissolved)	6.2 μg/L at >400 mg/L hardness A&Ww chronic	03/29/2001 – 9 mg/L 04/24/2001 – 8 mg/L 06/06/2001 – 9 mg/L	Remains impaired –3 exceedances of the chronic criteria during 3 consecutive months.
Copper	1300 μg/L – FBC	08/28/2003 – 2000 μg/L 11/12/2003 – 5500 μg/L	Attaining – Only 2 exceedances in 18 samples (binomial).
Copper (dissolved)	49.6 μg/L at >400 mg/L hardness 49.6 μg/L at >400 mg/L hardness 25.8 μg/L at 190 mg/L hardness 49.6 μg/L at >400 mg/L hardness 49.6 μg/L at >400 mg/L hardness 18.4 μg/L at 140 mg/L hardness 3.6 μg/L at 23 mg/L hardness 3.9 μg/L at 30 mg/L hardness 3.7 μg/L at 22 mg/L hardness 3.7 μg/L at 26 mg/L hardness	03/29/2001 – 75 μg/L 04/24/2001 – 56 μg/L 02/26/2003 – 140 μg/L 03/04/2003 – 65 μg/L 08/28/2003 – 120 μg/L 11/12/2003 – 190 μg/L 12/26/2003 – 31 μg/L 02/23/2004 – 78 μg/L 03/13/2004 – 18 μg/L 04/03/2004 – 9.7 μg/L	Remains impaired – 10 exceedances total. 8 exceedances in the last 3 years of monitoring.
Dissolved oxygen	6.0 mg/L A&WW	02/26/2003 - 5.1 mg/L 08/27/2003 - 5.2 mg/L	Attaining – One low dissolved oxygen value was due to low flow and ground water upwelling; therefore, only 1 sample did not meet criteria in 10 sampling events (binomial).
Lead	15 μg/L FBC	08/25/2003 – 90.2 μg/L 11/12/2005 – 340 μg/L	Attaining – Only 2 of 13 sampling events with an exceedance. (binomial)
Zinc (dissolved)	379 μg/L at >400 mg/L hardness 379 μg/L at >400 mg/L hardness A&W/w acute	06/06/2001 – 460 μg/L 10/11/2001 – 400 μg/L	Attaining – Although 2 exceedances in 2001, no exceedances in the last 3 years of monitoring. Note that ground water is being pumped and treated at Zonia Mine during this period.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEED	os		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient E. coli bacteria to assess FBC		Lab detection limits for dissolved metals (cadmium, copper, and zinc) were higher than A&W chronic criteria in at least 9 samples.	
MONITORING RECOMMENDATIONS		effectiveness of TMDL imp	admium, copper, and zinc samples to determine lementation strategies, once implemented. Collect ditions – when exceedances are most likely to	
		Collect missing core param assessment period.	eters to represent at least 3 seasons during an	
		Use lower detection limits	for dissolved metals.	

GILA RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Dripping Springs Wash to San Pedro River 15050100 – 009 11.0 Miles	A&Ww – Attaining FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 1 Attaining	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 11/18/2002 –	05/21/2003		
DATABASE #	-	NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
Below Dripping Springs Wash MGGLR343.27 101652	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, and zinc 4 total metals only: Boron, lead, manganese, mercury, nickel	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Suspended sediment concentration 4 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
MORE SAMPLES TO ASSESS		DISTRIBUTION	
	Collected all core parameters		Lab detection limit for selenium was higher than A&Wc chronic criteria.
MONITORING RECOMMEN	DATIONS	Low Priority –Use lower la	b detection limit for selenium.

GILA RIVER From San Pedro River to Mineral	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Creek 15050100 - 008	A&Ww – Impaired FBC – Attaining FC – Attaining Agl – Attaining AgL – Attaining	Category 5	Suspended sediment	Add suspended sediment to the 303(d) List.

SITE NAMES AGENCY ID # PURPOSE DATABASE #		SAMPLING DATE: 09/12/2001 – 08/10/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
At Kelvin USGS #09474000 MGGLR313.73 100748	USGS Ambient	12-13 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	12-13 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	13 E. coli bacteria 13 Fluoride 13 Total dissolved solid: 13 Suspended sediment concentration 12 Turbidity

EXCEEDANG	LES .		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	08/10/2004 – 300 CFU/100 ml	Inconclusive – Only one exceedance in past 3 years of data (1 of 13 samples).
Lead	15 μg/L FBC	09/09/2003 – 29 μg/L 08/10/2004 – 22.9 μg/L	Attaining – Only 2 exceedance in 13 samples. (Binomial)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	12/05/2001 – 141 mg/L – 240 cfs 08/21/2002 – 173 mg/L – 8 cfs 03/26/2003 – 915 mg/L – 408 cfs* 09/09/2003 – 658 mg/L – 3.2 cfs 12/08/2003 – 161 mg/L – 0.2 cfs 03/23/2004 – 182 mg/L – 285 cfs 08/10/2004 – 956 mg/L – 31 cfs	Impaired – 7 of 13 samples exceeded the 80 mg/L criterion. One of the exceedances (*) was not included in the geometric mean calculation because the flow was above the 50th Percentile of flow (300 cfs). Using the remaining samples, the geometric mean exceeded 80 mg/L three times.
Selenium	2.0 µg/L A&Ww chronic	06/23/2003 – 3.0 mg/L	Inconclusive – Selenium exceeded the standard 1 time during the last 3 years of monitoring. Note exceedance occurred during low flow (0.2 cfs).

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEED	S	
EXCEEDANCES NEEDING MISSING CORE		MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
E. coli bacteria and selenium Collected all core			Lab detection limit for dissolved mercury was higher than A&Wc chronic criteria.
MONITORING RECOMMEN	FORING RECOMMENDATIONS High Priority –Collect additional suspended sedimen support development of a TMDL. The old turbidity exceeded in 6 of 12 samples. Recommend using block bottom deposits implementation procedures in this radopted.		TMDL. The old turbidity standard (50 NTU) was es. Recommend using biocriteria assessments and
		Collect additional selenium	and <i>E. coli</i> bacteria samples due to exceedances.
		Use a lower lab detection	limit for dissolved mercury.

GILA RIVER From Salt River to Agua	USE	SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Fria River 15070101 015 3.7 Miles	A D E Q	A&Wedw – Attaining PBC – Attaining FC – Inconclusive Agl – Attaining AgL Attaining	Category 2 Attaining All Uses		
	E P A	FC – Impaired (Affected use only)	Category 5 Impaired	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were relisted by EPA in 2002.

SITE NAMES AGENCY ID # PURPOSE DATABASE #		SAMPLING DATES: 11/20/2001 – 08/09/2002		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above El Mirage Road MGGLR204.04 101264	ADEQ Ambient	4 total and dissolved: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total	4 E. coli bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity
		4 total metals only: Boron, lead, manganese, mercury	Kjeldahl nitrogen, dissolved oxygen, pH	2 Chlorine

EXCEEDAN	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
			Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS Pesticides in fish tissue Collected all core parameters		MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH Lab detection limit for selenium was higher than A&Wedw chronic criteria.	
DISCUSSION OF PESTICIDE I	MPAIRMENT	consumption ad A fish consumpti	completed in 2006 indicates that the fish visory for these pesticides should remain in effect. on advisory issued in 1991 remains in effect.	
MONITORING RECOMMENDATIONS		High Priority – Collect pest support development of T. Use a lower lab detection		

GILA RIVER From Agua Fria River to	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Waterman Wash 15070101 014 11.9 Miles	ADEQ	A&Wedw – Inconclusive PBC – Inconclusive FC – Inconclusive Agl – Inconclusive Agl. – Inconclusive	Category 3		
	E P A	FC – Impaired (Affected use only)	Category 5 Impaired	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were relisted by EPA in 2002.

SITE NAMES ID #	AGENCY PURPOSE				
DATABASE #					
		Metals	Nutrients - Related	Other	
At Estrella Parkway MGGLR199.33 101495	ADEQ Ambient	2 total and 2 dissolved: Antimony, arsenic, beryllium, cadmium, copper, lead, manganese, mercury, and zinc 2 total metals only: Boron and chromium	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solid: 2 Turbidity	

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Pesticides in fish tissue	Insufficient core parameters to assess designated uses	Insufficient monitoring events	Lab detection limits for dissolved mercury, dissolved lead, and total selenium were higher than A&Wedw chronic criteria.	
DISCUSSION OF PESTICIDE I	MPAIRMENT	consumption ad	cide impairment: completed in 2006 indicates that the fish visory for these pesticides should remain in effect. on advisory issued in 1991 remains in effect.	
MONITORING RECOMMENDATIONS		High Priority – Collect pesticides to support development of TMDL development. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower lab detection limits for selenium, dissolved lead, and dissolved		

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GILA RIVER From Waterman Wash to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Hassayampa River 15070101 010 13.9 Miles	A A&Wedw - Inconclusive PBC - Inconclusive FC - Inconclusive Agl Inconclusive AgL - Inconclusive	Category 3 Inconclusive		
	E P FC – Impaired (Affected use only)	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were re-listed by EPA in 2002.

MONITORING USED IN THIS ASSESSMENT	
No Current Data	Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

DATA GAPS AND MONITORING NEE	EDS .
DISCUSSION OF PESTICIDE IMPAIRMENT	Evidence of potential pesticide impairment:
MONITORING RECOMMENDATIONS	High Priority – Collect samples to support pesticide TMDL development.

GILA RIVER From Hassayampa River to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Centennial Wash 15070101 009 7 Miles	A & Wedw - Inconclusive PBC - Inconclusive FC - Inconclusive Agl - Inconclusive AgL - Inconclusive	Category 3		
	E P FC - Impaired (Affected use only)	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were re-listed by EPA in 2002.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT	
No Current Data	Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

 A risk assessment completed in 2006 indicates that the fish
consumption advisory for these pesticides should remain in effect.
 A fish consumption advisory issued in 1991 remains in effect.
High Priority - Collect samples to support pesticide TMDL development.

GILA RIVER	USE SUPPORT		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From Centennial Wash to Gillespie Dam 15070101 008 5.3 Miles	ADEQ	A&Wedw - Impaired PBC - Inconclusive FC - Attaining Agl Impaired Agl Attaining	Category 5	Boron and selenium in the water column	Boron on list since 1992. Selenium was added in 2004
	EPA	FC - Impaired (Affected use only)	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were re-listed by EPA in 2002.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/28/2000 – 05/19/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Above diversion at Gillespie Dam USGS #09518000 MGGLR167.44 100734	USGS Ambient	18 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, and zinc	18 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	18 E. coli bacteria 18 Fluoride 18 Total dissolved solids 18 Suspended sediment concentration 18 Turbidity		

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT	
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS	
Boron	1000 μg/L Agl	ALL 18 SAMPLES EXCEEDED Concentrations ranged from 1700 µg/L to 3080 µg/L	Remains impaired – 18 exceedances in 18 samples.	
			Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue	
E. coli bacteria	576 CFU/100 ml PBC	03/27/2003 >2675 CFU/100 ml	Inconclusive – 1 exceedance in the last 3 years of monitoring	
Selenium	2.0 μg/L A&Wedw	14 exceedances (Too many to display) Concentrations ranged from <1 to 18 µg/L	Remains impaired – 14 of 18 samples exceeded the criterion. 8 of the measurements were 5.0 μ g/L or higher.	

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MISSING CORE MORE SAMPLES TO ASSESS PARAMETERS E. coli bacteria, pesticides in fish tissue		MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
DISCUSSION OF PESTICIDE IMPAIRMENT		Evidence of potential pesticide impairment:		
MONITORING RECOMMENDATIONS		High Priority – Collect samples to support development of TMDLs for pesticides, boron, and selenium. Collect <i>E. coli</i> bacteria due to the exceedance.		

GILA RIVER From Gillespie Dam to Rainbow Wash 15070101 007 5.1 Miles	USE S	UPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wedw - Inconclusive PBC - Inconclusive FC - Inconclusive Agl - Inconclusive Agl - Inconclusive	Category 3		
	E P A	FC – Impaired (Affected use only)	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were re-listed by EPA in 2002.

MONITORING USED IN THIS ASSESSMENT	
No Current Data	Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

DATA GAPS AND MONITORING NE	EEDS
DISCUSSION OF PESTICIDE IMPAIRMENT	Evidence of potential pesticide impairment:
	 A risk assessment completed in 2006 indicates that the fish consumption advisory for these pesticides should remain in effect.
	 A fish consumption advisory issued in 1991 remains in effect.
MONITORING RECOMMENDATIONS	High Priority – Collect samples to support pesticide TMDL development.

GILA RIVER From Rainbow Wash to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Sand Tank 15070101 005 16.9 Miles	A A&Wedw - Inconclusive PBC - Inconclusive FC - Inconclusive Agl - Inconclusive Agl - Inconclusive	Category 3 Inconclusive		
	E FC – Impaired P (Affected use only)	Category 5 Impaired	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were relisted by EPA in 2002.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT	
No Current Data	Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

DATA GAPS AND MONITORING NI	EEDS
DISCUSSION OF PESTICIDE IMPAIRMENT	Evidence of potential pesticide impairment:
	 A risk assessment completed in 2006 indicates that the fish consumption advisory for these pesticides should remain in effect. A fish consumption advisory issued in 1991 remains in effect.
MONITORING RECOMMENDATIONS	High Priority – Collect samples to support pesticide TMDL development.

From Sand Tank to Painted Rocks Reservoir 15070101 001 18.7 Miles	USE	SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
	A D E Q	A&Wedw - Inconclusive PBC - Inconclusive FC - Inconclusive Agl - Inconclusive AgL - Inconclusive	Category 3 Inconclusive		
	E P A	FC - Impaired (Affected use only)	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were relisted by EPA in 2002.

MONITORING USED IN THIS ASSESSMENT		
No Current Data	Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue	

DATA GAPS AND MONITORING NI	EEDS
DISCUSSION OF PESTICIDE IMPAIRMENT	Evidence of potential pesticide impairment:
MONITORING RECOMMENDATIONS	High Priority – Collect samples to support pesticide TMDL development.

HASSAYAMPA LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15070103 3160 2 Acres	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive	Category 3	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 05/08/2001		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Inlet MGHAS - C 103432	Westin, Inc Special Inv.	I total and dissolved metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, and zinc	None	1 Fluoride 1 Total dissolved solids
		1 total metals only: Mercury		

EXCEEDANCES					
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS		
Copper (dissolved)	9.6 µg/L at 70 mg/L hardness A&Wc acute	05/08/2001 – 14.4 μg/L	Inconclusive – 1 exceedance in a 3-year period		
Lead	15 μg/L FBC	05/08/2001 – 25 μg/L	Inconclusive – Only sample exceeded the criteria.		

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Copper and lead	Insufficient core parameters	Insufficient monitoring events.	Lab detection limits for selenium, thallium, and dissolved mercury were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Collect a exceedances.	dditional copper and lead data due to the
		Collect additional core parameters to represent at least 3 seasons during a assessment period.	
		Use lower lab detection lin	nits for selenium, thallium, and dissolved mercur

HASSAYAMPA RIVER From headwaters to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Copper Creek 15070103 – 007A 11.0 Miles	A&Wc – Impaired FBC – Impaired FC – Attaining Agl – Impaired AgL – Impaired	Category 5 (pH) Impaired Category 4A (Cadmium, copper, zinc) Not Attaining	Cadmium, copper, zinc, and pH	Add pH. TMDL completed and approved in 2002 for cadmium, copper, and zinc

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 09/27	SAMPLING PERIOD: 09/27/2000 - 05/10/2001; 03/04/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Headwaters MGH\$R115.34 101151	ADEQ TMDL	58-69 total and dissolved: Cadmium, copper, and zinc	62 pH 41 Dissolved oxygen 8 Nitrite/nitrogen	7 Fluoride 7 Total dissolved solids		
Downstream of spring MGHSR114.54 101005	ADEQ TMDL	3-7 total and dissolved: Antimony, arsenic, barium, beryllium, chromium, manganese, nickel, silver 1-2 total and 0-2 dissolved: Boron, selenium, thallium 6 total and 2 dissolved (2 dates): Mercury	8 Total nitrogen 1 Total phosphorus			
Upstream of Wetland Mine MGHSR113.96 103435	Westin, Inc Special inv.					
At Wetland Mine MGHSR113.91 103436	Westin, Inc Special inv.					
Below Wetland Mine - Babble MGHSR113.86 100942	ADEQ TMDL					
Above Hassayampa Lake MGHSR113.60 103431	Westin, Inc Special inv.					
Above McCleur Mine tributary MGHSR113.17 101067	ADEQ TMDL					
At McCleur Mine tributary MGHSR 113.16 101066	ADEQ TMDL					
Below McCleur Mine tributary MGHSR113.15 101065	ADEQ TMDL					
Above Senator Mine MGHSR113.09 100465	ADEQ and Westin Special inv.					
At Senator Mine MGHSR113.01 101084	ADEQ TMDL					
Below Senator Mine MGHSR112.97 103355	Westin, Inc Special inv.					
Further below Senator Mine MGHSR112.91 100466	ADEQ TMDL					
At Whisper MGHSR111.40 100941	ADEQ TMDL					
At Jersey MGHSR108.19 101195	ADEQ TMDL					

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Cadmium	50 μg/L – Agl, AgL and 84 μg/L – FC	03/23/2001 – 157 μg/L 04/16/2001 – 56 μg/L	Attaining – Only 2 exceedances of the 50 μ g/L criterion and only 1 exceedance of the 84 μ g/L criterion in 12 samples (binomial)
Cadmium (dissolved)	14.1 µg/L at 322 mg/L hardness 13.2 µg/L at 284 mg/L hardness 13.7 µg/L at 294 mg/L hardness 19.1 µg/L at >400 mg/L hardness 7.1 µg/L at 161 mg/L hardness 19.1 µg/L at >400 mg/L hardness A&Wc acute	11/07/2000 – 28 µg/L 01/10/2001 – 35 µg/L 02/13/2001 – 37 µg/L 03/23/2001 – 161 µg/L 04/10/2001 – 23 µg/L 04/17/2001 – 52 µg/L 05/10/2001 – 22.9 µg/L 06/07/2001 – 45 µg/L 08/07/2001 – 38 µg/L 01/28/2002 – 28 µg/L	Remains impaired – 10 exceedances during the last 3 years of monitoring.
Copper	500 μg/L – AgL and 1300 μg/L – FBC	11/07/2000 - 4077 µg/L 01/10/2001 - 2455 µg/L 02/13/2001 - 2832 µg/L 03/23/2001 - 1670 µg/L 04/10/2001 - 2147 µg/L 06/07/2001 - 2062 µg/L 08/07/2001 - 1747 µg/L	Remains impaired – In 7 of 13 sampling events, the criteria were exceeded (binomial).
Copper (dissolved)	40.4 μ g/L at 322 mg/L hardness 35.9 μ g/L at 284 mg/L hardness 37.1 μ g/L at 294 mg/L hardness 12.2 μ g/L at 90 mg/L hardness 21.0 μ g/L at 161 mg/L hardness 49.6 μ g/L at >400 mg/L	11/07/2000 - 4077 µg/L 01/10/2001 - 2504 µg/L 02/13/2001 - 2830 µg/L 03/23/2001 - 1520 µg/L 04/10/2001 - 2174 µg/L 04/17/2001 - 110 µg/L	Remains impaired – 9 exceedances in the last 3 years monitored (13 sampling events).
•	hardness 49.6 µg/L at >400 mg/L hardness 19.1 µg/L at >400 mg/L hardness 19.1 µg/L at >400 mg/L hardness A&Wc acute	05/10/2001 – 112 μg/L 06/07/2001 – 1994 μg/L 08/07/2001 – 1730 μg/L	
Dissolved oxygen	6.0 mg/L A&Wc	09/27/2000 - 5.1 mg/L 11/07/2000 - 6.5 mg/L 03/23/2001 - 4.9 mg/L	Attaining – Low dissolved oxygen is due to naturally occurring conditions of low flow and ground water upwelling.
Lead	15 μg/L FBC	06/07/2001 – 16 μg/L	Inconclusive – Only 1 exceedance in 4 samples. (Binomial) Exceedance was only marginally over the criterion.
рН	>6.5 SU A&Wc, FBC, AgI, AgL	11/07/2000 - 3.4 SU 1/10/2001 - 3.6 SU 02/13/2001 - 4.0 SU 03/23/2001 - 4.1 SU 04/10/2001 - 3.8 SU 06/07/2001 - 3.4 SU 08/07/2001 - 3.9 SU	Impaired – Exceeded criterion in 21 of 59 samples (during 7 of 13 sampling events) (Binomial)
Selenium	2.0 µg/L A&Wc chronic	05/09/2001 – 3.6 SU	Inconclusive – Exceeded criterion only once during the assessment period. Lab reporting limit was higher than criterion for all other analyses.
Zinc	10,000 μg/L Agl	03/23/2001 15,300 μg/L	Attaining - Only 1 exceedance in 13 sampling events. (Binomial)
Zinc (dissolved)	291 μ g/L at 293 mg/L hardness 332 μ g/L at 342 mg/L hardness 316 μ g/L at 322 mg/L hardness 379 μ g/L at >400 mg/L hardness 379 μ g/L at >400 mg/L hardness 379 μ g/L at >400 mg/L hardness 175 μ g/L at 161 mg/L hardness 379 μ g/L at >400 mg/L hardness 379 μ g/L at >400 mg/L hardness 379 μ g/L at >400 mg/L hardness	02/10/2000 - 770 µg/L 09/26/2000 - 510 µg/L 11/07/2000 - 2280 µg/L 01/10/2001 - 3160 µg/L 02/13/2001 - 3500 µg/L 03/23/2001 - 13000 µg/L 04/10/2001 - 2080 µg/L 04/17/2001 - 5040 µg/L 05/10/2001 - 2040 µg/L 06/07/2001 - 5120 µg/L	Remains impaired – Criteria were exceeded in 7 times during the last 3 years of monitoring (12 of 12 samples during the assessment period.)

379 μg/L at >400 mg/L hardness 03/04/2005 – 2400 μg/L A&Wc acute	379 μg/L at >400 m	g/L hardness 01/28/2002 – 2680 µg/L g/L hardness 03/04/2005 – 2400 µg/L	
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Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC			
MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead, and selenium	Insufficient E. coli bacteria and boron to assess FBC and Agl.	DITRIBUTION	Lab detection limits for selenium and dissolved metals (cadmium, copper, mercury) were higher than A&W/w chronic criteria in at least 6 samples.
MONITORING RECOMMENDATIONS		the stream will also correct priority. Collect cadmium, effectiveness of TMDL imp samples during critical cond Collect additional lead and Collect missing core param assessment period.	to reduce cadmium, copper, and zinc loadings to pH; therefore, TMDL development is a low copper, zinc, and pH samples to determine lementation strategies, once implemented. Collect ditions when exceedances are likely to occur. I selenium samples due to exceedances, eters to represent at least 3 seasons during an inits for selenium and dissolved metals.

HASSAYAMPA RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Copper Creek to Blind Indian Creek 15070103 – 007B 20 Miles	A&Ww - Attaining FBC - Attaining FC - Attaining Agl Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES	AGENCY	SAMPLING DATES: 02/02/200				
ID#	PURPOSE	NUMBER AND TYPES OF SAMPLES				
DATABASE #		Metals	Nutrients - Related	Other		
At Climax Mine MGH\$R102.01 101196	ADEQ TMDL	8-42 total and dissolved: Antimony, arsenic, barium, beryllium, cadmium, chromium,	20-39 samples: Ammonia, total nitrogen, nitrite/nitrate,	18 <i>E. coli</i> bacteria 20 Fluoride 18 Total dissolved solid:		
At intermittent site MGH\$R095.83 101193	ADEQ TMDL	copper, lead, mercury, nickel, silver, thallium, and zinc	total phosphorus, total Kjeldahl nitrogen, pH, and dissolved oxygen	10 Suspended sediment concentration 18 Turbidity		
At gaging station MGH\$R092.07 100940	ADEQ TMDL	8-20 total and 0-1 dissolved: Boron, manganese				
Walnut Grove School MGHSR089.46 101004	ADEQ TMDL					
At Milk Creek MGHSR086.26 101128	ADEQ TMDL					
Below Milk Creek MGHSR085.79 100464	ADEQ Ambient					
At Blind Indian Creek MGHSR083.94 101003	ADEQ TMDL					

EXCEEDANCE	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	9.9 µg/L at 72 mg/L hardness A&Ww acute	11/06/2000 – 84 μg/L	Attaining – No exceedances in the last 3 years of monitoring.
Dissolved oxygen	6.0 mg/L A&Ww	02/02/2000 - 4.8 mg/L 09/08/2000 - 5.8 mg/L	Attaining – Low dissolved oxygen levels are due natural conditions and ground water upwelling.
E. coli bacteria	235 CFU/100 ml FBC	06/04/2001 – 530 CFU/100 ml	Attaining – No exceedances in the last 3 years of monitoring.
Zinc (dissolved)	88.7 µg/L at 72 mg/L hardness A&Ww acute	11/06/2000 – 190 μg/L	Attaining – No exceedances in the last 3 years of monitoring.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MO	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
E. coli bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved metals (cadmium, mercury) were higher than A&Ww chronic criteria in at least 11 samples.
MONITORING RECOMMENDATIONS			t <i>E. coli</i> bacteria samples due to exceedance. imit for selenium and dissolved metals.

HASSAYAMPA RIVER	USE SUPPORT	OVERALL ASSESSMENT
From Cottonwood Creek to Martinez Wash 15070103 – 004 32.1 Miles	A&Ww – Attaining FBC – Inconclusive FC – Attaining AgI – Attaining AgL – Attaining	Category 2 Attaining some uses

SITE NAMES ID#	AGENCY PURPOSE	SAMPLING DATES: 02/11/2000 -	- 04/19/2005		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At BLM gage, Box Canyon Dam MGH\$R058.80 100463	ADEQ and USGS Ambient	16-24 total and dissolved: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, and zinc	21-22 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen,	21 E. coli bacteria 21 Fluoride 19 Total dissolved solids 11 Suspended sediment concentration	
		8 total and dissolved: Barium, nickel, silver, thallium 8-20 total and 0-1 dissolved: Boron, manganese	dissolved oxygen, pH	21 Turbidity	

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
E. coli bacteria	235 CFU/100 ml FBC	02/17/2004 - 480 CFU/100 ml	Inconclusive – Only 1 exceedance in a 3 year period.

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW	
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH	
E. coli bacteria	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&WW chronic criteria in at least 12 samples.	
MONITORING RECOMMENDATIONS		Medium Priority – Collect <i>E. coli</i> bacteria samples due to exceedance. Use lower lab detection limit for selenium and dissolved mercury.		

HASSAYAMPA RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Sols Wash to 8 miles below Wickenburg 15070103 – 002A 9.2 Miles	A&Ww – Attaining FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATES: 10/18/2001 – 04/05/2002				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At Nature Conservancy MGH\$R048.20 100462	ADEQ Ambient	3 total and dissolved: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 3 total and 0-1 dissolved: Boron, lead, manganese, mercury 1 total and 1 dissolved: Barium, nickel, silver, thallium	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 3 Fluoride 3 Total dissolved solids 3 Turbidity		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 μg/L Α&Ww	10/18/2001 – 3.0 mg/L 01/17/2002 – 3.4 mg/L 04/05/2002 – 2.9 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling Flow at 0.1 cfs.
E. coli bacteria	235 CFU/100 ml FBC	04/05/2002 - 590 CFU/100 ml	Inconclusive – Only 1 exceedance in a 3 year period.

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
E. coli bacteria	Collected all core parameters	3	Lab detection limits for selenium and dissolved mercury were higher than A&WW chronic criteria.	
MONITORING RECOMMENDATIONS		Medium Priority – Collect <i>E. coli</i> bacteria samples due to exceedance. Use lower lab detection limit for selenium and dissolved mercury.		

HASSAYAMPA RIVER From Buckeye Canal to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Gila River 15070103 – 001B 2.3 Miles	A A&Ww - Inconclusion D FBC - Attaining E FC - Attaining Q Agl Attaining	Attaining Some Uses		
	E P FC – Impaired (Affected use only) A	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were relisted by EPA in 2002.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATES: 11/01/2001		
DATABASE #	TABASE # NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other
Above Gila River MGH\$R000.77 101197	ADEQ Ambient	4 total and dissolved: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 4 total and 0-1 dissolved: Boron, lead, manganese, mercury 1 total and 0-1 dissolved: Barium, nickel, silver, selenium, thallium	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
			Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue
Selenium	2.0 μg/L A&Ww chronic	11/01/2001 – 5.4 μg/L	Inconclusive – Only 1 exceedance during the assessment period. (Lab detection limit problems on other samples – see below.)

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Selenium, pesticides in fish tissue	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria.	
DISCUSSION OF PESTICIDE I	MPAIRMENT	consumption ad	cide impairment: t completed in 2006 indicates that the fish visory for these pesticides should remain in effect. ion advisory issued in 1991 remains in effect.	
MONITORING RECOMMENDATIONS		High Priority – Collect pesticides to support development of pesticide TMDLs. Collect selenium samples due to exceedance. Use lower lab detection limit for selenium and dissolved mercury.		

INDIAN BEND WASH	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Salt River 15060106B 179 4.8 Miles	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/12/200	05 – 01/21/2005		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
At 40th Street MGIBW014.04 101520	USGS Special study	4 total metals only: Cadmium, copper, lead, and zinc and mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH		

EXCEEDANCES				
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS	
Lead	15 µg/L PBC	12/04/2001 – 25 μg/L 09/06/2002 – 38 μg/L 01/20/2003 – 25 μg/L	Inconclusive – 3 exceedances in 4 samples. (Binomial approach requires a minimum of 5 exceedances and 20 samples to assess as impaired.) (EPA may add this to the 303(d) List)	

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead	Insufficient dissolved cadmium, copper, zinc to assess A&We.		
MONITORING RECOMMEN	IDATIONS	Medium Priority - Collect	t lead due to exceedances.
		Collect core parameters to assessment period.	o represent at least 3 seasons during an

KEARNY LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15050100 - 6666 8 Acres	A&Ww - Inconclusive FBC - Inconclusive FC - Inconclusive	Category 3 Inconclusive	

MONITORING	G USED IN THI	S ASSESSMENT		
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 06/15/2000 – 01/07/2003 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Mid Lake MGKEA - B 102552	AGFD Ambient	3-9 total metals only: Arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury	4-9 samples: Ammonia, total nitrogen, nitrite/nitrate, total	5 Fluoride 9 Total dissolved solids
Boat ramp MCKEA - BR 102550	AGFD Ambient	nickel, silver, and zinc	phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	
At inflow MCKEA - IN 102551	AGFD Ambient			1

EXCEEDANG	TF2		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient <i>E. coli</i> bacteria, dissolved cadmium, copper, and zinc and total mercury to assess FBC, A&W, and FC		Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least 3 seasons. Use lower lab detection limits for selenium and dissolved mercury.	

LAKE PLEASANT	USE SUPPORT	OVERALL ASSESSMENT	
15070102 1100 8000 Acres	A&Ww - Attaining FBC - Attaining FC - Attaining DWS - Attaining AgI - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/14/2000	0 – 09/24/2004			
DATABASE #	300	NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At dam MGPLE A 100067	ADEQ and U of A Ambient	15-23 total and 7-10 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium,	35-45 samples: Ammonia, total nitrogen, nitrite/nitrate,	3 <i>E. coli</i> bacteria 31 Fluoride 20 Total dissolved solids		
Mid lake MGPLE – B 100068	ADEQ and U of A Ambient	chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc	total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	26 Turbidity 10-15 Benzene, ethylbenzene, toluene,		
At riverine zone MGPLE – C 101708	ADEQ and U of A Ambient			xylene		
Castle Creek arm MGPLE - CSTL 102554	AGFD Ambient					
Agua Fria arm MGPLE – AGUA 102553	AGFD Ambient					
At marina MGPLE – MAR 101000	ADEQ and U of A Ambient					

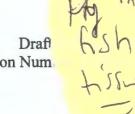
EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&W/w	11/26/2003 – 5.4 mg/L 09/24/2004 – 4.6 mg/L	Attaining – 2 exceedances in 15 sampling events (9 of 39 samples). (Binomial)
рН	<6.5 SU A&Ww, FBC, AgL	09/05/2001 – 10.5 SU	Attaining - Only 1 exceedance in 15 sampling events (2 of 45 samples) (Binomial)
Selenium	2.0 μg/L A&Ww chronic	05/29/2001 – 3.0 μg/L	Attaining – No exceedances during the last three years.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria in at least 8 samples.
FISH TISSUE MONITORING		Preliminary results indicate that a fish consumption advisory for mercury may be issued based on edible fish tissue results exceeding 0.3 mg/kg. Results from a second round of monitoring are currently being analyzed.	
MONITORING RECOMMENDATIONS		Low Priority –Use lower la mercury.	b detection limit for selenium and dissolved

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LITTLE ASH CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Ash Creek 15070102 039 17.7 Miles	A&Ww – Inconclusive PBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATES: 04/18/2002	2			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
	5 20 10 20 20	Metals	Nutrients - Related	Other		
Near Estler Peak MGLAS004.52 100578	ADEQ Ambient	1 total and dissolved: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 1 total metals only: Boron, lead, manganese, mercury	1 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solid: 1 Turbidity		

EXCEEDANG	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient core parameters to assess designated uses	Insufficient monitoring events	Lab detection limit for selenium was higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority —Collect missing core parameters to represent at least 3 season during an assessment period. Use a lower lab detection limit for dissolved mercury.	

LAKE PLEASANT	USE SUPPORT	OVERALL ASSESSMENT	
15070102 1100 8000 Acres	A&Ww – Attaining FBC – Attaining FC – Attaining DWS – Attaining AgI – Attaining AgL – Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/14/2000	00 – 09/24/2004		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
At dam MGPLE A 100067	ADEQ and U of A Ambient	15-23 total and 7-10 dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium,	35-45 samples: Ammonia, total nitrogen, nitrite/nitrate,	3 <i>E. coli</i> bacteria 31 Fluoride 20 Total dissolved solids	
Mid lake MGPLE – B 100068	ADEQ and U of A Ambient	chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc	total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	26 Turbidity 10-15 Benzene, ethylbenzene, toluene, xylene	
At riverine zone MGPLE – C 101708	ADEQ and U of A Ambient				
Castle Creek arm MGPLE - CSTL 102554	AGFD Ambient				
Agua Fria arm MGPLE – AGUA 102553	AGFD Ambient				
At marina MGPLE – MAR 101000	ADEQ and U of A Ambient				

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	11/26/2003 – 5.4 mg/L 09/24/2004 – 4.6 mg/L	Attaining – 2 exceedances in 15 sampling events (9 of 39 samples). (Binomial)
pН	<6.5 SU A&Ww, FBC, AgL	09/05/2001 – 10.5 SU	Attaining – Only 1 exceedance in 15 sampling events (2 of 45 samples) (Binomial)
Selenium	2.0 μg/L A&Ww chronic	05/29/2001 – 3.0 μg/L	Attaining – No exceedances during the last three years.

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than A&Ww chronic criteria in at least 8 samples.
FISH TISSUE MONITORING			ible fish tissue results exceeding 0.3 mg/kg. Results
MONITORING RECOMMENDATIONS		Low Priority –Use lower la mercury.	b detection limit for selenium and dissolved

LITTLE ASH CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Ash Creek 15070102 039 17.7 Miles	A&Ww – Inconclusive PBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATES: 04/18/2002				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Near Estler Peak MGLAS004.52 100578	ADEQ Ambient	1 total and dissolved: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 1 total metals only: Boron, lead, manganese, mercury	1 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 <i>E. coli</i> bacteria 1 Fluoride 1 Total dissolved solid: 1 Turbidity		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient core parameters to assess designated uses	Insufficient monitoring events	Lab detection limit for selenium was higher than A&Ww chronic criteria.	
MONITORING RECOMMENDATIONS		Low Priority -Collect missing core parameters to represent at least 3 season during an assessment period. Use a lower lab detection limit for dissolved mercury.		

LYNX LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15070102 0860 50 Acres	A&Wc – Attaining FBC – Inconclusive FC – Attaining DWS Inconclusive AgI – Attaining AgL – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE				
DATABASE #		NUMBER AND TYPES OF SAM	APLES		
		Metals	Nutrients - Related	Other	
At dam MGLYN - A 100037	ADEQ and AGFD Ambient Weston, Inc Special Inv.	3-6 total and dissolved metals: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, selenium,	3-7 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen,	1 <i>E. coli</i> bacteria 8 Fluoride 2 Total dissolved solids 6 Turbidity	
Mid lake MGLYN – B 100038	ADEQ Ambient	silver, and zinc	dissolved oxygen, pH		
At Lynx Creek inlet MGLYN – C 100039	Weston, Inc Special Inv				
At boat ramp MGLYN – BR 101399	ADEQ and AGFD Ambient				

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Lead	15 μg/L FBC	03/09/2001 – 53 μg/L	Inconclusive – 1 exceedance in 3 sampling events. (Binomial)
Manganese	980 μg/L DWS	04/25/2000 – 1073 µg/L 03/09/2001 – 2033 µg/L 04/29/2002 – 1280 µg/L 05/22/2002 – 2650 µg/L	Inconclusive – 4 exceedances in 5 sampling events. (Binomial requires a minimum of 5 exceedances and 20 samples to assess as impaired.) (EPA may add this to the 303(d) List.)

DATA GAPS AND MC EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead and manganese	Insufficient E. coli bacteria to assess FBC		Lab detection limit for dissolved mercury was higher than A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Collect a exceedances. Use lower lab	additional lead and manganese data due to the detection limit for dissolved mercury.

MARTINEZ CANYON	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Box Canyon 15050100 – 080 9.5 Miles	A&W/w - Attaining FBC - Inconclusive FC - Attaining	Category 2	
9.5 Miles	AgL – Attaining	Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 05/16/200	2 05/27/2003			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Below Martinez Mine MGMZC006.18 101349	ADEQ Ambient	5 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, and zinc 5 total and 0-1 dissolved: Boron, lead, manganese, mercury	5 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	5 E. coli bacteria 5 Fluoride 5 Total dissolved solids 4 Suspended sediment concentration 5 Turbidity		

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&W/w	05/16/2002 – 3.1 mg/L 11/20/2002 – 5.9 mg/L 03/26/2003 – 4.5 mg/L 05/27/2003 – 3.3 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling. Flow between 0.01-0.05.
Lead	15 μg/L FBC	01/21/2003 – 25 mg/L 03/26/2003 – 40 mg/L	Inconclusive – 2 exceedances in 5 samples. (Binomial approach requires a minimum of 5 exceedances in 20 samples to assess as impaired.)

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW	
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH	
Lead	Collected all core parameters	e Ar	Lab detection limits for selenium and dissolved mercury were higher than A&WW chronic criteria.	
MONITORING RECOMMENDATIONS		Medium Priority -Collect additional lead data due to the exceedances. Use lower lab detection limits for selenium and dissolved mercury.		

MINERAL CREEK From Devil's Canyon		OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
to Gila River 15050100 – 012B	A&Ww – Impaired FBC – Inconclusive FC – Inconclusive AgL – Attaining	Category 5 (selenium, low DO) Category 4B (copper) Impaired	Selenium, copper, and low dissolved oxygen	Adding low dissolved oxygen. Added selenium in 2004. Mine under a consent decree to mitigate copper pollution.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 01/10/2000 – 06/17/2005		
DATABASE #		NUMBER AND TYPES OF SAM	MPLES	
		Metals	Nutrients - Related	Other
At Indian Gardens MGMIN008.81 103331	ASARCO Effectiveness monitoring	217-218 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium,	218 samples: Nitrite/nitrate, pH, dissolved oxygen	217 Fluoride 217 Total dissolved solids
At tunnel inlet MGMIN006.99 103332	ASARCO Effectiveness monitoring	copper, lead, nickel, selenium silver, thallium, and zinc		217 Turbidity
At tunnel outlet MGMIN003.69 103333	ASARCO Effectiveness monitoring			
At channel outlet MGMIN002.65 103334	ASARCO Effectiveness monitoring			
At Highway 177 bridge MGMIN001.38 100472	ASARCO Effectiveness monitoring			

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Only reviewed excee	dances that occurred after extensive	e treatment initiated in 20	01.
Copper (dissolved)	8.0 µg/L at 58 mg/L hardness 6.7 µg/L at 48 mg/L hardness 9.1 µg/L at 66 mg/L hardness A&Ww acute	03/06/2003 – 12 μg/L 03/11/2004 – 17 μg/L 2/15/2005 – 20 μg/L	Remains Impaired – 3 exceedances during the last 3 years of monitoring. Copper exceedances occurred during high flows.
Dissolved oxygen	6.0 mg/L A&Ww	Too many to list here. Did not meet standards in 29 samples.	Impaired – Low dissolved oxygen in 29 of 218 samples (binomial). Cause of low dissolved oxygen is unknown, but may be due to natural conditions, such as groundwater upwelling.
Selenium	2.0 µg/L A&Ww chronic	35 sampling events – Too many to list here.	Remains Impaired – 35 exceedances during the assessment period. 28 were at or above 5 μ g/L.

DATA GAPS AND MC	NITORING NEED	os	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient <i>E. coli</i> and mercury to assess FBC and FC.		Lab detection limits for dissolved metals (cadmium, copper, lead, nickel, and silver) were higher than A&W chronic criteria in at least 7 samples.
MONITORING RECOMMENDATIONS		High Priority -Collect selenium and dissolved oxygen samples to support TMDL development. Collect copper samples to determine effectiveness of treatment. Use lower detection limits for dissolved metals. Collect missing core parameters to represent at least 3 seasons during an assessment period.	

MINNEHAHA CREEK	USE SUPPORT	OVERALL ASSESSMENT	
i i o i i i i caawaters i iassayanipa	A&Ww - Inconclusive FBC - Inconclusive FC - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 03/05/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Near Hassayampa River MGMHA000.24 102955	ADEQ TMDL	total and dissolved metal sample: Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, manganese, mercury, silver, and zinc total metals only: Lead and nickel	1 Dissolved oxygen and pH	1 Total dissolved solids	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient core parameters	Insufficient monitoring events	Lab detection limits for selenium and dissolved metals (lead, mercury, nickel) were higher than A&Wc chronic criteria.	
MONITORING RECOMMENDATIONS		Low Priority -Collect additional core parameters to represent at least 3 seasons during an assessment period.		
		Use lower lab detection li	mits for selenium and dissolved metals.	

PAINTED ROCKS RESERVOIR	USI	E SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
15070101 – 1020A 100 Acres (This is a flood retention basin)	A D E Q	A&Ww - Inconclusive FBC - Inconclusive FC - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 3 Inconclusive		
	E P A	FC - Impaired (Affected use only)	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were re-listed by EPA in 2002.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

MONITORING USED IN THIS ASSESSMENT	
No Current Data	Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

DATA GAPS AND MONITORING NI	EDS
DISCUSSION OF PESTICIDE IMPAIRMENT	Evidence of potential pesticide impairment:
MONITORING RECOMMENDATIONS	High Priority - Collect samples to support pesticide TMDL development.

See also Painted Rock Lake assessment in the Colorado River - Lower Gila Watershed

PAPAGO PARK PONDS USE SUPPORT 15060106B - 1030 A&Ww - Inconcis

24 Acres

USE SUPPORT

A&Ww - Inconclusive
PBC - Inconclusive
FC - Inconclusive
Inconclusive

SITE NAMES ID #	PURPOSE	SAMPLING DATES: 12/20/2002		
DATABASE #	NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other
At dam MGPAP - A 101047	ADEQ Ambient	2 total and dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium, copper, lead, mercury, manganese, nickel, selenium, silver, and zinc 2 total and 0-1 dissolved:	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 2 Fluoride 2 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient core parameters.	Insufficient sampling events	Lab detection limit for dissolved mercury was higher than A&Ww chronic criterion.	
MONITORING RECOMMENDATIONS		Low Priority -Collect missing core parameters to represent at least 3 season during an assessment period.		
		Use a lower lab detection lin	nit for dissolved mercury.	

POTTS CANYON	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Queen Creek 15050100 – 1856 10.6 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 08/10/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above Queen Creek MGPTC000.01 103097	ADEQ TMDL	total and dissolved: Cadmium, chromium, copper, mercury, and zinc total metals only: Arsenic,	1 samples: Dissolved oxygen, and pH	1 Fluoride 1 Total dissolved solid: 1 Suspended sediment concentration	
		lead, manganese			

EXCEEDANCES	5		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L FBC	08/10/2005 – 79 μg/L	Inconclusive – Only 1 sampling exceedance. (Binomial)
Copper (dissolved)	29.3 µg/L at >400 mg/L hardness A&Ww chronic	08/10/2005 – 49 μg/L	Inconclusive – Only 1 exceedance during the assessment period. Exceedance occurred during a summer storm and may not represent chronic (4-day average) conditions.
Lead	15 μg/L – FBC 100 μg/L – AgL	08/10/2005 – 170 μg/L	Inconclusive – Only 1 exceedance. (Binomial)
Mercury	0.6 μg/L FC	08/10/2005 – 1.1 μg/L	Inconclusive – Only 1 exceedance (Binomial)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	08/10/2005 – 1859 mg/L	Inconclusive – Only 1 sampling date. Insufficient samples to assess, as need a minimum of 4 samples to calculate a geometric mean and compare to standard.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Arsenic, copper, lead, mercury, and suspended sediment	Insufficient core parameters	Insufficient sampling events	Lab detection limits for selenium and dissolved mercury were higher that A&Ww chronic criteria.
MONITORING RECOMMENDATIONS		sediment concentration samp	a assessments and bottom deposits
		implementation procedures in this reach, when they are adopted. Collect sufficient core parameters to represent at least 3 seasons during an	
		assessment period. Use lowe mercury.	r lab detection limits for selenium and dissolved

QUEEN CREEK	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From headwaters to mining WWTP discharge 15050100 - 014A 8.8 Miles	A&We – Impaired PBC – Attaining AgL – Attaining	Category 5	Copper	Copper on list since 2002. TMDL being developed.

SITE NAMES	AGENCY	SAMPLING DATE: 04/10/2003 – 08/10/2005				
ID#	PURPOSE	NUMBER AND TYPES OF SAMPLES				
DATABASE #		Metals	Nutrients - Related	Other		
Headwaters MGQEN045.93 103091	ADEQ TMDL	11-26 total and dissolved: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc 12 total and 4-5 dissolved: Barium, boron, selenium 26 total and 1 dissolved: Manganese	15-25 samples: Nitrite/nitrate, pH, dissolved oxygen	7 <i>E. coli</i> bacteria 13 Fluoride 15 Total dissolved solids		
Below Omya Pump Station Spring MGQEN044.42 103092	ADEQ TMDL and Resolution Cu Effectiveness			5 Suspended sediment concentration 13 Turbidity		
Above Oak Flat MGQEN041.74 103093	ADEQ TMDL					
Below Oak Flat MGQEN041.34 103094	ADEQ TMDL					
At boulder hole MGQEN040.17 103463	Resolution Copper Effectiveness					
Below Superior water tank MGQEN039.75 103564	ADEQ TMDL					
Magma Ave and Queen Creek MGQEN038.73 103095	ADEQ TMDL					
Below NPDES Permit discharge MGQEN037.09 103096	ADEQ TMDL					

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	18.0 µg/L at 76 mg/L hardness 8.7 µg/L at 35 mg/L hardness A&We acute	12/29/2004 – 44 μg/L 08/10/2005 – 49 μg/L	Remains impaired – 2 exceedances during the last 3 years of monitoring. Exceedances are occurring at normal flows (0.6 cfs).

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	All core parameters were collected		
MONITORING RECOMMEN	DATIONS	High Priority -Collect copp	per samples to support TMDL development.

QUEEN CREEK From mining WWTP discharge to	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Potts Canvon	A&Wedw – Impaired PBC – Inconclusive	Category 5	Copper	Copper on 303(d) List since 2004. TMDL being developed

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 11/14/2002 – 08/30/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
Above Boyce Thompson Arboretum MGQEN034.66 100624	ADEQ Ambient and TMDL	4-7 total and dissolved: Antimony, arsenic, beryllium cadmium, chromium, copper, and zinc	4-7 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus,	4 <i>E. coli</i> bacteria 6 Fluoride 4 Total dissolved solids 5 Suspended sediment	
State Park logger location ADEQ	ADEQ TMDL	5-7 total and 0-2 dissolved: Boron, lead, manganese, and mercury	nitrite/nitrate, pH, dissolved oxygen	concentration 4 Turbidity 2 Chlorine	
		2 selenium			

EXCEEDANCE	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Chlorine	11 µg/L A&Wedw acute	03/31/2003 – 90 μg/L	Inconclusive – Only 1 exceedance in 2 samples.
Copper (dissolved)	49.6 µg/L at >400 mg/L hardness A&Wedw acute	11/14/2002 – 50 μg/L	Remains impaired – 1 exceedance during the last 3 years of monitoring.
Copper (dissolved)	29.3 µg/L at >400 mg/L hardness 29.3 µg/L at >400 mg/L hardness 23.5 µg/L at 310 mg/L hardness A&Wedw chronic	11/14/2002 – 50 µg/L 01/13/2003 – 37 µg/L 08/10/2005 – 33 µg/L	Remains impaired – 1 of these 3 exceedances (33 μ g/L) was during an elevated flow (2.3 cfs), so may not represent chronic conditions (4 day exposure). Therefore, 2 exceedances in a 3-year period.
Dissolved oxygen	3.0 mg/L (daytime) A&Wedw	05/19/2003 - 1.6 mg/L	Inconclusive – Only 1 exceedance in 7 samples. (Binomial) (Note: sample was collected at 11 am.)
Selenium	2.0 µg/L A&Wedw chronic	11/14/2002 – 5.8 μg/L	Inconclusive – Only 1 exceedance in the last 3 years of monitoring. (See note below about lab detection limits)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DETECTION LIMITS NOT LOVER DISTRIBUTION ENOUGH	
Chlorine, dissolved oxygen, and selenium Collected all core parameters			Lab detection limit for selenium and dissolved mercury were higher than A&Wedw chronic criteria in 1 or more samples.
MONITORING RECOMMENDATIONS		High Priority -Collect copp	per samples to support TMDL development.
•		Collect chlorine, dissolved exceedances.	oxygen, and selenium samples due to
		Use lower detection limit f	or selenium and dissolved mercury.

QUEEN CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Potts Canyon to Whitlow Canyon 15050100 – 014C 8.0 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 08/10/2005	5	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Queens Station MGQEN030.06 103098	ADEQ TMDL	1 total and dissolved: Cadmium, chromium, copper, mercury, and zinc	1 samples: Dissolved oxygen, and pH	1 Fluoride 1 Total dissolved solid: 1 Suspended sediment concentration
		1 total metals only: Arsenic, lead, manganese		

POLLUTANT.	STANDARD	DATES	DESIGNATED USE SUPPORT
POLLOTAINT	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L FBC	08/10/2005 – 52 μg/L	Inconclusive – Only 1 sampling exceedance. (Binomial)
Copper (dissolved)	24.6 µg/L at 190 mg/L hardness A&Ww acute	08/10/2005 – 39 μg/L	Inconclusive – Only 1 exceedance in 3-year period.
Mercury	0.6 μg/L FC	08/10/2005 – 1.1 μg/L	Inconclusive – Only 1 exceedance. (Binomial)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	08/10/2005 – 88 mg/L	Inconclusive – Although sample was marginally above the 80 mg/L criterion, there were insufficient samples to assess, as need a minimum of 4 samples to calculate a geometric mean and compare to standard. Also, the sample was collected during a monsoon rain event, so would not be included in the geometric mean calculation.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Arsenic, copper, mercury, and suspended sediment	Insufficient core parameters	Insufficient sampling events	Lab detection limits for selenium and dissolved mercury were higher that A&Ww chronic criteria.
MONITORING RECOMMEN	IDATIONS	Recommend using biocriteria implementation procedures i	enic, copper, mercury, and suspended sediment of exceedances. a assessments and bottom deposits in this reach, when they are adopted. eters to represent at least 3 seasons during an relab detection limits for selenium and dissolved

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SALT RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Granite Reef Dam for 2 kilometers 15060106B-001A 1.6 Miles	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive DWS – Inconclusive AgI – Inconclusive AgL Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/19/2002 – 12/04/2003 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
At Granite Reef diversion dam MGSLR041.57 102769	AGFD Ambient	3-4 total metals only: Arsenic, barium, cadmium, chromium, copper, lead, manganese, selenium, and zinc	5-7 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	6 Total dissolved solids 2 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Chromium	100 μg/L PBC	07/19/2002 – 184 μg/L	Inconclusive – Only 1 exceedance in 4 samples. (Binomial)
Lead	15 μg/L PBC	07/19/2002 – 234 μg/L 07/31/2002 – 44 μg/L	Inconclusive – 2 exceedances in 4 samples. (Binomial requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Chromium and lead	Insufficient dissolved metals (cadmium, copper, and zinc), E. coli bacteria, mercury, fluoride, and boron to assess A&Ww, FBC, FC, DWS, AgI.	DITRIBUTION	LNOGOLI
MONITORING RECOMMEN	DATIONS		chromium and lead due to exceedances. o represent at least 3 seasons during an

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SALT RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From 2 kilometers below Granite Reef Dam to Interstate 10 bridge 15060106B-001B 19 Miles	A&We - Inconclusive PBC - Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 01/12/2005 – 01/21/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
At Priest Drive USGS #09512165 MGSLR022.76 101493	AGFD Ambient	2 total metals only: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, and zinc 2 total metals only: Boron, manganese, and selenium	2 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solids 2 Turbidity

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events.	
MONITORING RECOMMENDATIONS		Low Priority - Collect suff seasons during an assessm	icient core parameters to represent at least 3 ent period.

SALT RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From Interstate 10 bridge to 23rd Avenue WWTP discharge 15050106B-001C 7.9 Miles	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 07/19/2002 – 12/04/2003 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
At 19th Avenue bridge MCSLR013.36 102767	AGFD Ambient		1 sample: Ammonia, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	1 Total dissolved solid

EXCEEDANCES				
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS	
No Exceedances				

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	
MONITORING RECOMMENDATIONS		Low Priority – Collect core parameters to represent at least 3 seasons during an assessment period.	

SALT RIVER From 23 rd Avenue WWTP	US	E SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
discharge to Gila River 15060106B-001D 14.1 Miles	A D E Q	A&Wedw - Attaining PBC - Attaining FC - Inconclusive Agl - Attaining Agl Attaining	Category 2 Attaining Some Uses		
	E P A	FC – Impaired (Affected use only)	Category 5	DDT, toxaphene, and chlordane in fish tissue.	DDT, toxaphene, and chlordane were re-listed by EPA in 2002.

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/20/2001 – 08/09/2002 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients - Related	Other
Below Tres Rios discharge MGSLR003.33 101265	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, mercury, and zinc 4 total metals only: Boron, lead, and manganese	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	4 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity 3 Chlorine

EXCEEDANCES			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			Fish consumption advisory due to DDT, toxaphene, and chlordane in fish tissue

Pollutant: Assume "total" concentration, unless shown as dissolved.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Pesticides in fish tissue	Collected all core parameters	And the second s	Lab detection limit for selenium was higher than A&W chronic criteria.	
DISCUSSION OF PESTICIDE I	MPAIRMENT	consumption ad A fish consumpt	at completed in 2006 indicates that the fish lvisory for these pesticides should remain in effect. ion advisory issued in 1991 remains in effect.	
MONITORING RECOMMENDATIONS		High Priority – Collect pesticides data to support TMDL development. Use a lower detection limit for selenium.		

SKUNK CREEK	USE SUPPORT	OVERALL ASSESSMENT	
I Total neddwaters to regula i na	A&Ww – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/29/2002 – 03/16/2003		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
At 79th Avenue, north bank MG\$KU001.43 101521	USGS Special study	3 total metals only: Cadmium, copper, lead, mercury, and zinc	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	

EXCEEDAN	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Lead	15 μg/L FBC	01/08/2003 – 18 μg/L	Inconclusive – 1 exceedance in 3 samples. (Binomial)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Lead	Insufficient dissolved metals (cadmium, copper, and zinc), E. coli bacteria, and mercury to assess A&Ww, FBC, and FC		
MONITORING RECOMMEN	DATIONS	Medium Priority – Co exceedance.	ollect additional lead data due to the
		Collect core paramete assessment period.	ers to represent at least 3 seasons during an

SYCAMORE CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From Tank Canyon to Agua Fria River 15070102 – 024B 17.6 Miles	A&Ww - Attaining FBC - Attaining FC - Attaining AgL - Attaining	Category 1 Attaining	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 12/21/200	1 – 09/20/2002	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Above Sycamore Ranger Station MGSYD009.13 100704	ADEQ Ambient	4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, copper, and zinc 4 total and 0-2 dissolved: Boron, chromium, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solid 4 Turbidity

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for selenium was higher than A&Ww chronic criteria.
MONITORING RECOMMEN	DATIONS	Low Priority – Use a lower	lab detection limit for selenium.

USE SUPPORT	OVERALL ASSESSMENT	
A&Ww – Inconclusive FBC – Inconclusive FC – Attaining	Category 2 Attaining	
	A&Ww – Inconclusive FBC – Inconclusive	ASSESSMENT A&Ww - Inconclusive Category 2 FBC - Inconclusive

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/27/2001 – 07/22/2004 Weekly sampling from 01/04/2001 – 03/27/2006				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At downstream dam MGTTL - A 101316	ADEQ and City of Tempe Ambient	72 total and 0-1 dissolved: Antimony, arsenic, barium, beryllium, boron, cadmium,	78 samples: Ammonia, total nitrogen, nitrite/nitrate, total	352 <i>E. coli</i> bacteria 6 Fluoride 11 Total dissolved solids		
Near upstream dam MGTTL - B 101315	ADEQ and city of Tempe Ambient	chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc	phosphorus, total Kjeldahl nitrogen.	1317 Turbidity		
Mid lake MGTTL - MID 102452	ADEQ and AGFD Ambient		280 Dissolved oxygen 1332 pH			
Mid depth MGTTL – MDEP (not in ADEQ's database)	City of Tempe Ambient (metals)					
Marina MCTTL – MAR (not in ADEQ's database)	City of Tempe Ambient (bacteria and metals)					
50 feet off shore MCTTL – 50 (not in ADEQ's database)	City of Tempe Ambient (field)					

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	>6.0 mg/L A&W/w	After treatment in 2002: 07/15/2004 - 5.4 mg/L 07/22/2004 - 4.1 mg/L 07/29/2004 - 5.1 mg/L 08/05/2004 - 5.1 mg/L 10/22/2004 - 5.4 mg/L 08/29/2005 - 5.7 mg/L	Attaining – 6 low dissolved oxygen samples out of 280 samples (binomial). Dissolved oxygen was collected at only one of the City of Tempe sites (50 feet off shore). It was also collected when ADEQ and AGFD monitored. (Copper sulfate has been added to the lake since 2002 to control algal blooms.)
E. coli bacteria	235 CFU/100 ml FBC	02/14/2003 – 1700 CFU/100 ml 01/25/2005 – 240 CFU/100 ml 07/31/2003 – 900 CFU/100 ml 09/11/2003 – 240 CFU/100 ml	Inconclusive – Although there were four exceedances of standards during the last 3 years of monitoring, weight-of-evidence does not support listing the lake as impaired. See discussion below.
pH (high	<9.0 SU A&Ww, FBC	After treatment in 2002: 01/09/2006 – 9.3 SU (2 sites) 02/07/2006 – 9.3 SU	Attaining – Only 2 exceedances in 890 samples after treatment was begun in 2002. (Copper sulfate has been added to the lake since 2002 to control algal blooms.)
Mercury	0.6 μg/L FC	08/02/2001 – 0.7 μg/L 12/06/2001 – 0.7 μg/L 06/06/2002 – 0.7 μg/L	Attaining – 3 of 72 samples exceeded the criterion. (Binomial)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient dissolved metals to assess A&W (cadmium, copper, and zinc)		Lab detection limit for dissolved mercury was higher than A&WW chronic criteria.
DISCUSSION OF E. COLIBAC	TERIA EXCEEDANCES	does not support listing the 1. The exceedance flood flows top USGS gage on It 625 cfs (normal contaminated b) 2. The exceedance CFU. Both of the must be exceeded 3. Two of the exceeduring our cold sailing is uncomed. ADEQ has proposo that the bino samples, only 4. 5. The City of Terrestrict swimming contaminated by the exceeded sailing is uncomed.	s on 9/11/2003 and 1/25/2005 were both at 240 ese are below the 300 CFU screening value that ed for listing decisions. Redances (2/14/2003 and 1/25/2005) occurred est months when even incidental swimming while
MONITORING RECOMMENDATIONS		Collect missing core param	neters to represent at least 3 seeasons during an ower lab detection limit for dissolved mercury.

TURKEY CREEK	USE SUPPORT	OVERALL ASSESSMENT	
TURKEY CREEK From headwaters to unnamed tributary at 341928/1122128 15070102 - 036A 9.1 Miles	A&Ww – Attaining FBC – Inconclusive FC – Inconclusive AgI – Inconclusive AgL – Attaining	Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 03/14/2000 – 12/19/2003					
DATABASE #		NUMBER AND TYPES OF SAME	NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other			
At Forest Road 261 MGTRK030.07 101523	ADEQ TMDL	Arsenic, beryllium, cadmium, chromium, copper, lead, and zinc 3 total and 0-2 dissolved: Boron	7-9 samples: Dissolved oxygen and pH. 1 sample: total nitrogen, nitrite/nitrate, total phosphorus, total Kjeldahl nitrogen	1 Suspended sediment concentration			
At Forest Road 706 MCTRK029.80 101524	ADEQ TMDL						
At Goodwin, AZ MGTRK024.35 101626	ADEQ TMDL						
At Senator Weir MGTRK021.52 102519	ADEQ TMDL						
Upstream of 5000 MSL MGTRK021.44 102512	ADEQ TMDL						

EXCEEDANC	ES	>	
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	6.0 mg/L A&Ww	12/19/2003 – 6.1 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling. Flow 0.003 cfs.

DATA GAPS AND MC EXCEEDANCES NEEDING	NITORING NEED MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient mercury, E. coli, and manganese to assess FC, FBC, and Agl.		Lab detection limits for selenium and dissolved metals (cadmium, copper, lead, mercury) were higher than A&Ww chronic criteria in at least 2 samples.
MONITORING RECOMMENDATIONS		Low Priority – Collect core an assessment period. Use dissolved metals.	parameters to represent at least 3 seasons during lower lab detection limits for selenium and

TURKEY CREEK From unnamed tributary at	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
341928/1122128 to Poland Creek 15070102 - 036B 21.0 Miles	A&Ww - Impaired FBC - Impaired FC - Inconclusive Agl - Attaining Agl - Impaired	Category 5	Copper and lead	TMDL out for public review and comment. When approved by EPA, Water will be moved to Category 4. Delist cadmium and zinc.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 02/08/2000 – 02/23/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
	-	Metals	Nutrients - Related	Other		
At trail 202 MGTRK016.12 102517	ADEQ TMDL	17-46 total and dissolved metals: Arsenic, boron, cadmium, chromium, copper, lead,	20 Dissolved oxygen 46 pH 17 Total phosphorus 10 Nitrate/nitrite 1 Total nitrogen and total Kjeldahl nitrogen	4 Suspended sediment concentration 9 Cyanide		
At corral MCTRK015.90 101538	ADEQ TMDL	manganese, and zinc 37 total and 5 dissolved: Mercury				
Upstream of Bear Creek MGTRK015.47 102511	ADEQ TMDL	3-6 total metals only: Beryllium 1 total and dissolved: Antimony				
North of Cleator, at Forest Road 93 MGTRK007.28 101083	ADEQ TMDL					
Crown King Road bridge MGTRK004.42 101627	ADEQ TMDL					
Below Golden Belt Mine MGTRK004.33 102518	ADEQ TMDL					
Below Golden Turkey Mine MGTRK003.89 102510	ADEQ TMDL					
At old bend below Golden Belt and Golden Turkey MGTRK003.71 101082	ADEQ TMDL					
At Silver Cord Mine MGTRK001.53 100587	ADEQ TMDL					
At Poland Creek MGTRK000.09 102513	ADEQ TMDL					

EXCEEDANG	CE2		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Arsenic	50 μg/L – FBC 200 μg/L – AgL 1450 μg/L – FC 2000 μg/L Agl	03/17/2003 – 2800 μg/L 08/14/2003 – 98 μg/L	Attaining – Exceeded the criteria in 1 or 2 of 17 events. (Binomial)
Cadmium	50 μg/L – Agl, AgL 84 μg/L – FC	09/09/2003 – 170 μg/L	Attaining – Only 1 exceedance in 46 samples. (Binomial)

Chromium	100 μg/L FBC	08/14/2003 – 147 μg/L	Attaining – 1 exceedance in 17 sampling events (1 in 30 samples). (Binomial)
Copper	500 μg/L – AgL	08/15/2003 – 569 μg/L	Attaining – 1 exceedance in 19 sampling events (1 in 46 samples) (Binomial)
Copper (dissolved)	17.2 µg/L at 130 mg/L hardness 49.6 µg/L at >400 mg/L hardness A&Ww acute	08/15/2003 – 25 μg/L	Remains impaired – 1 exceedances in the last 3 years of monitoring
Dissolved oxygen	6.0 mg/L A&Ww	12/19/2003 – 4.9 mg/L	Attaining – Low dissolved oxygen due to natural conditions of low flow and ground water upwelling. (Flow 0.001 cfs.)
Lead	14 μg/L – FBC 100 μg/L – AgL	09/11/2002 – 103 μg/L 02/26/2003 – 564 μg/L 03/17/2003 – 4,800 μg/L 08/14/2003 – 1235 μg/L 08/21/2003 – 38 μg/L	Remains impaired – Criterion 14 μ g/L was exceeded in 5 of 20 sampling events (15 of 46 samples). Concentrations were greater than AgL criterion (100 μ g/L) in 4 of 20 sampling events. (Binomial)
Lead (dissolved)	61.8 µg/L at >400 mg/L hardness A&Ww acute	08/21/2003 – 110 μg/L	Remains impaired – 1 exceedance in last 3 years.
Mercury	0.6 μg/L FC	03/17/2003 – 0.76 μg/L 08/15/2003 – 0.9 μg/L	Inconclusive – 2 of 4 sampling events exceeded the criterion. (7 of 18 samples) (Binomial requires a minimum of 5 exceedances and 20 samples to assess as impaired.)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Ww	13/17/2003 – 490 mg/L	Inconclusive – Exceeded criterion during only sampling event monitored for this parameters. This sample was collected during storm flows, so could not be used in calculating the geometric mean. Insufficient data to calculate a geometric mean.

DATA GAPS AND MC		-		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Mercury, SSC	Need E. coli bacteria to assess FBC.		Lab detection limits for dissolved metals (cadmium, copper, lead, mercury, zinc) were higher than A&Ww chronic criteria in at least 10 samples.	
DELIST CADMIUM AND ZIN	C	No exceedances in to	otal or dissolved cadmium criteria 45 sampling events. otal or dissolved zinc in 45 sampling events. ed at multiple sites and represent various conditions of f events.	
MONITORING RECOMMENDATIONS		Collect metals data to strategies, once imple metals. Collect arsenic and su Recommend using bio	ollect arsenic, mercury and SSC due to exceedances. o determine effectiveness of TMDL implementation emented. Use lower lab detection limits for dissolved aspended sediment samples due to the exceedances. occiteria assessments and bottom deposits edures in this reach, when they are adopted.	
		Collect missing core parameters to represent at least 3 seasons. During the assessment period.		

UNNAMED TRIBUTARY TO LYNX CREEK

From headwaters to Lynx Creek 15070102 -- 124 1.0 Miles

USE SUPPORT	OVERALL ASSESSMENT
 A&Wc – Inconclusive FBC – Inconclusive	Category 3
FC – Inconclusive	Inconclusive

SITE NAMES	AGENCY	SAMPLING DATE: 05/11/2001 NUMBER AND TYPES OF SAMPLES			
ID#	PURPOSE				
DATABASE #		Metals	Nutrients - Related	Other	
Above Sheldon waste rock MGULN000.75 103428	Weston Inc Special inv for EPA	6 dissolved metal sample at 6 sites: Antimony, arsenic, barium, beryllium, cadmium, chromium,	None	6 Fluoride 6 Total dissolved solids	
At Sheldon waste rock MGULN000.70 103429	Weston Inc Special inv for EPA	copper, lead, manganese, mercury, nickel, silver, thallium, and zinc			
Below Sheldon waste rock MGULN000.64 103430	Weston Inc Special inv for EPA	(All sites sampled once on the same date.)			
Upstream of Blue John trib. MGULN000.23 103419	Weston Inc Special inv for EPA				
At Blue John tributary MGULN000.16 103420	Weston Inc Special inv for EPA				
Downstream of Blue John trib MGULN000.11 103421	Weston Inc Special inv for EPA				

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Cadmium (dissolved)	19.12 µg/L at >400 mg/L hardness A&Wc acute	05/11/2001 – 135 μg/L	Inconclusive - Only 1 sampling event with an exceedance (5 sites). High magnitude noted.
Cadmium	84 μg/L FC	05/11/2001 – 135 μg/L	Inconclusive – Only 1 sampling event with an exceedance (2 sites). (Binomial)
Copper (dissolved)	49.6 µg/L at >400 mg/L hardness A&Wc acute	05/11/2001 – 22,200 μg/L	Inconclusive - Only 1 sampling event with an exceedance (5 sites). High magnitude noted.
Copper	1300 μg/L FBC	05/11/2001 - 22,200 μg/L (dissolved portion)	Inconclusive – Only 1 sampling event with an exceedance (5 sites). (Binomial)
Zinc (dissolved)	379.3 μg/L at >400 mg/L hardness A&Wc acute	05/11/2001 – 8730 μg/L	Inconclusive – Only 1 sampling event with an exceedance (5 sites). High magnitude noted.

Pollutant: Assume "total" concentration, unless shown as dissolved.

DATA GAPS AND MC	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
Cadmium, copper, and lead	Insufficient dissolved oxygen and <i>E. coli</i> bacteria to assess A&Wc and FBC.		Lab detection limits for selenium and dissolved mercury were higher than A&Wc chronic criteria.
MONITORING RECOMMENDATIONS		Medium Priority –Collect cadmium, copper, and lead samples due to the exceedances. Use lower lab detection limits for selenium and dissolved mercury. Collect missing core parameters to represent at least 3 seasons.	

Salt Watershed

Watershed Description

This watershed is composed of the Salt River drainage from its headwaters to Granite Reef Dam, excluding the Verde River drainage. This watershed can be divided into four very distinct sub-basins: White River, Black River, Tonto Creek, and the main stem Salt River.

The population of this 6,242 square mile watershed is approximately 40,500 people (2000 census), with most of this population in the Superior-Globe-Miami mining district. Land ownership is approximately: 49% Tribal, 48% federal, 2% private, and 1% state. The principal land uses are open range grazing, recreation, forestry, and mining. Nine wilderness areas have been set aside, which have restricted land uses and activities.

Elevations range from 10,600 feet (above sea level) in the White Mountains, to about 2,000 feet at Granite Reef Dam. The watershed above Roosevelt Lake (White River, Black River, and Tonto Creek) is above 5,000 feet elevation with high desert flora and fauna, and coldwater aquatic communities where perennial waters exist. The area below Roosevelt Lake is below 5,000 feet, and therefore, contains primarily warmwater aquatic communities.

Water Resources

This Watershed receives more precipitation than most of the state, with approximately 20 inches of rain and 20 inches of snowfall. Roosevelt Lake and a chain of other reservoirs (Apache, Canyon, and Saguaro) were constructed to store perennial flow from this watershed and provide much of the water used in the Phoenix metropolitan area.

An estimate of surface water resources in the Salt Watershed is provided in **Table X.** Waters on Indian lands are not assessed by ADEQ; therefore, those statistics are shown separately.

Table X. Estimated Surface Water Resources in the Salt Watershed

	Perennial	Intermittent	Ephemeral
Stream miles	510	1,190	2,785
	Perennial	Non-perennial	
Lake acres	25,544	0	

On Indian Lands - Not Assessed

	Perennial	Intermittent	Ephemeral
Stream miles On Indian Lands	825	0	4,275
	Perennial	Non-perennial	
Lake acres On Indian Lands	1,858	0	

Ambient monitoring focuses on perennial waters; however, special investigations may identify water quality problems on intermittent and even ephemeral waters. Estimated miles and acres are based on USGS digitized hydrology at 1:100,000 and have been rounded to the nearest 5 miles or 5 acres.

Map of watershed showing:

Generalized topography
Highways
Cities
National Forests, Monuments, Refuges
HUCs (the subdivisions by number)

Watershed Partnerships

- The Friends of Pinto Creek
 This group is dedicated to the preservation of Pinto Creek and its tributaries, which flow through
 the copper mining area near Globe. They are dedicated to the preservation of Pinto Creek,
 Powers Gulch and Haunted Canyon. This group meets as needed. Contact Tom Sonandres at
 (623) 583-6764 or pintocreek@asu.edu for more information.
- Northern Gila County Water Planning Alliance The watershed of interest is bounded by Mogollon Rim to the north, Roosevelt Lake to the south, Sierra Ancha Mountains to the east, and Mazatzal Mountains to the west. The alliance was formed to develop water strategies for the area around Payson, Pine, and Strawberry (a.k.a. Tonto Creek Basin). This group meets as needed. Contact Steve Besich, Assistant County Gila Manager at sbesich@co.gila.za.us; Lionel Martinez, rim Trail Water Improvement District at (928) 474-2029; or Howard Matthews, pine-Strawberry Water Improvement District at (928) 476-2142.

Special Studies and Water Quality Improvement Projects

Total Maximum Daily Load Analyses – The following TMDL analyses have been completed, are ongoing, or are scheduled to be completed in this watershed. Further information about the status of these investigations or a copy of the TMDL, if completed, can be obtained at ADEQ's website: www.azdeq.gov.

- Canyon Lake is impaired by low dissolved oxygen.
 Low dissolved oxygen is generally associated with nutrient loading and eutrophic conditions
 which can lead to algal blooms and even fish kills. A TMDL is to be initiated in 2008 to determine
 the cause and controllable sources of the low dissolved oxygen and recommend strategies to
 meet surface water quality standards.
- Crescent Lake is impaired due to high pH (alkalinity).
 High pH readings are also frequently associated with nutrient loading (see Canyon Creek comments). High pH values may represent concerns for most designated uses, but pose the biggest risk to aquatic life. A TMDL is scheduled to be initiated in 2008.
- Christopher Creek and Tonto Creek, above Haigler Creek confluence, are impaired by bacteria
 Escherichia coli) contamination.
 Bacteria contamination may pose a risk to humans swimming or even wading in the water. A
 bacteria TMDL was completed in 2004 for both Christopher Creek and Tonto Creek. Septic and
 waste disposal systems were identified as the primary source of bacterial loading. The TMDL
 recommended inspection, repair, and upgrading of these systems, and improving facilities at
 heavily used recreational sites. The U.S. Forest Service and Gila County Health Department were
 encouraged to initiate routine bacterial monitoring.
- Tonto Creek, above Haigler Creek confluence, is also impaired by nitrogen (nutrients). Excess nitrogen can lead to eutrophic conditions and algal blooms. A nitrogen TMDL was approved in 2005. Three sources of excess nutrients were identified: septic systems, insufficient restroom facilities at recreational sites along Tonto Creek, and the Tonto Creek Fish Hatchery. ADEQ will work with the Arizona Game and Fish Department to determine new permit discharge limits for the hatchery and the means for achieving these limits. Inspection, repair, and upgrading of septic systems, along with improving waste facilities at recreational sites, were also recommended actions so that nutrient standards will be met.
- Pinto Creek is impaired by copper, and the segment of Pinto Creek downstream of Ripper Spring
 is also impaired by selenium.

Both copper and selenium concentrations pose a risk to aquatic life and wildlife. Selenium was added on the 2004 Impaired Waters List for the downstream segment of Pinto Creek and a selenium TMDL is scheduled to be initiated in 2007.

The Pinto Creek Phase II TMDL Modeling Report, written by Malcolm Pirnie, Inc. for ADEQ (2006), describes the hydrology and pollutant transport for Pinto Creek basin in support of allocation of copper from discharges to the creek. Natural mineralization in the area has resulted in numerous historic and active mining related disturbances. This model scenario results lead to the following major conclusions:

 Gibson Mine is the single largest source of copper loads to Pinto Creek – over 90% of the copper load. Remediation efforts are necessary at this mining site;

o Remediation at other mining sources is expected to reduce copper;

o Much of upper Pinto Creek would exceed copper criteria even after remediation;

 The Carlotta Copper project (a new mine site being established on Pinto Cneek) is not predicted to cause large changes in copper loads or concentrations.

Aggressive remediation activities are being scheduled for the Gibson Mine, an abandoned mine (see Water Quality Improvement Grants below). Site specific standards are also being developed for copper in Pinto Creek because the natural background concentration is higher than the standard in this copper rich mining area.

 The Salt River, from Stewart Mountain Dam (Saguaro Lake) to the Verde River, is impaired by low dissolved oxygen and copper.
 Both pose a threat to aquatic life. More data is needed to identify sources and TMDILs have been scheduled to be initiated in 2008.

Water Quality Improvement Grant Projects – ADEQ awarded the following Water Quality Improvement Grants (319 Grants) in this watershed. More information concerning these grants or projects can be obtained at: http://www.azdeq.gov/environ/water/watershed/fin.html.

- Lower Salt River Pollution Prevention, Education, and Monitoring Project
 The Tonto National Forest (2000)
 Construct three restrooms in the Salt River Recreational Area and monitor bacteria levels in the segment of stream used for tubing and other recreation.
- Camp Geronimo Boy Scout Camp On-site Sewer Improvement Project Camp Geronimo Boy Scouts (2002 and 2004)
 Add treatment facilities and provide sealed vault and haul toilet units.
- Trees for the Rim Project

Arizona Community Tree Council (2003)

Provide trees and other vegetation at no cost to those private property owners whose trees and landscape plants were destroyed during the Rodeo-Chediski fire in 2002. These act ions are to help restore vegetation and thereby reduce runoff pollution.

Gibson Mine Remediation Project

Franciscan Friars of California (2005 and 2006)

Design, construct, and implement a manmade wetland to reduce copper, beryllium, ziric, and turbidity loadings to Pinto Creek and Mineral Creek.

Gila County Septic System Project

Gila County Health Department and Community Services (2005 and 2006)
Identify, repair, upgrade, or replace waste water systems that are structurally ursound or failing in the Christopher Creek and Tonto Creek (headwaters) area. These activities support implementation of the nitrogen and bacteria TMDLs established for these waters.

R-Bar-C Boy Scout Camp Sewer Facilities Project

Boy Scouts of America - Grand Canyon Council (2006)

Upgrade septic treatment and disposal facilities to prevent contamination of Christopher Creek.

Water Protection Fund Projects – The following Water Protection Fund Projects were awarded by the Arizona Department of Water Resources. More information about these funds or projects can be obtained from the ADWR web site at: http://www.azwater.gov.

• Canyon Creek Riparian Restoration Project

Arizona Game and Fish Department (2005)

Temporarily exclude grazing (5 to 10 years) from a half-mile reach of Canyon Creek. The goal of the exclosure is to improve water quality and restore native habitat.

Other Water Quality Studies

Lower Verde / Lower Salt River Management Plan and Restoration Strategy

Lower Verde / Lower Salt River Watershed Advisory Group (2000)

This plan identifies the areas of greatest concern for water resources, initiates pollution source identification, and identifies programs and potential actions to remediate these sources.

Phoenix Metropolitan Reservoir Study

David Walker, University of Arizona

This is an ongoing and comprehensive study of water quality in reservoirs serving the Phoenix metropolitan area. Goal is to collect and analyze data to answer water quality management questions in a proactive manner. A yearly report is produced. In 2005, the report provided information about:

- Climate and drought effects on water quality,
- Wildfire effects on water quality.
- Harmful algal blooms,
- Atmospheric deposition and the use of sediment to look at accumulation of pollutants, and
- o Endocrine disruption compounds.

• Characterization of Hydraulic Conductivity of the Alluvium and Basin Fill, Pinal Creek Basin near Globe, Arizona

Cory E. Angeroth – U.S. Geological Survey (2002)

Mining in the Pinal Creek area has resulted in acidic waters containing elevated concentrations of dissolved metals in the ground water. Slug tests were conducted in 1997 and 1998 to better understand contaminant transport through the regional aquifer (i.e., hydraulic conductivity). The tests showed that in the unconsolidated stream alluvium and in the basin fill, the lower the pH of the ground water, the higher the hydraulic conductivity. Likely, the low pH water is causing the dissolution of aquifer material.

• Assessment of Selected Inorganic Constituents in Streams in the Central Arizona Basins Study Area, Arizona and Northern Mexico, through 1998

David Anning – U.S. Geological Survey, National Water Quality Assessment Program (2003) Inorganic chemical data (dissolved solids, suspended sediment, and nutrients) and stream properties (temperature, pH, dissolved oxygen) were analyzed to assess water quality, determine natural and human factors affecting water quality, and compute stream loads.

- The total annual input fluxes from quantifiable sources of nitrogen and phosphorus (nutrients) were considerably higher for developed basins than for minimally developed basins (such as the Salt Watershed).
- For minimally developed basins, precipitation was the largest quantifiable source of nitrogen.

 The amount of nitrogen and phosphorus transported out of the basins was much smaller than the amount of quantifiable inputs. This indicates that most of the nutrients were not transported out in surface water, but were transported to the subsurface (soil or aquifer), released to the atmosphere (volatilized ammonia), or incorporated into the biomass (plants and animals).

Assessments

The Salt Watershed can be separated into the following drainage areas (subwatersheds):

15060101	Black River
15060102	White River (Tribal land - Not assessed)
15060103	Upper Salt River
15060104	Carrizo Creek (Tribal land - Not assessed.
15060105	Tonto Creek
15060106A	Lower Salt River

These drainage areas and the surface waters assessed as "attaining" or "impaired" are illustrated on the following watershed map. Methods used to complete these assessments are described in the "Surface Water Assessment Methods and Technical Support" document (2006).

Map of Black River Drainage Area - 15060101

All streams and lakes in HUC Assessments (Thick Red Impaired, Thick Blue attaining) Monitoring sites black triangle Identify by name any assessed and the main stem stream

15060106A-0070	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
2190 Acres	A&Wc - Impaired FBC - Inconclusive FC - Attaining DWS - Attaining Agl - Attaining Agl - Attaining	Category 5	Low dissolved oxygen	Add low dissolved oxygen to the 303(d) List

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 10/30/2000 – 11/05/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At dam SRAPA-A 100997	ADEQ, AGFD, UA Ambient	9-14 total and 5 dissolved: Cadmium, chromium, copper, lead, nickel, silver, zinc 6-15 total and 0-2 dissolved: Antimony, arsenic, barium, beryllium, boron, manganese, selenium, mercury, and thallium	42-45 samples: Ammonia, total nitrogen, nitrite/nitrate, total	11 <i>E. coli</i> bacteria 11 Fluoride 14 Total dissolved solids 24 Turbidity		
At transition zone SRAPA-B 101712	UA Ambient		Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH			
In riverine zone SRAPA-C 102139	ADEQ, AGFD, UA Ambient					
At beach SRAPA-BCH 101704	AGFD, UA Ambient					
At camping area SRAPA-BC 101707	AGFD, UA Ambient					
At Burnt Corral SRAPA-COR 102753	ADEQ, AGFD, UA Ambient					
Mid Lake SRAPA-E 100008	ADEQ, AGFD, UA Ambient					
At marina SRAPA-MAR 100998	AGFD Ambient					

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	SITES 10/30/2000 - 5.1 mg/L - all 09/05/2001 - 2.3 mg/L - C 10/03/2001 - 4.6 mg/L - C 05/30/2001 - 6.2 mg/L - B and C 08/20/2003 - 6.3 mg/L - A 03/10/2004 - 6.4 mg/L - B and C 04/09/2004 - 6.0 mg/L - C 06/01/2004 - 5.1 mg/L - all 11/05/2004 - 2.9 mg/L - all	Impaired – Low dissolved oxygen in the top meter in 16 of 38 samples in the top meter.) (Binomial) Low dissolved oxygen occurred during 9 of 17 monitoring events in the top meter of lake water. (Note: ADEQ has proposed changing the designated use at this lake to A&Ww, which has a dissolved oxygen standard of 6.0 mg/L. This would adjust the number of low dissolved oxygen samples to 8 of 38 samples (5 of 17 sampling events), and it would remain impaired.)

pH (high)	<9.0 SU A&Wc, FBC, DWS,	08/06/2001 - 9.2 SU 03/07/2003 - 9.4-9.8 SU	Attaining – pH exceeded standards in 2 of 15 sampling events. (Binomial)
	Agl, AgL		

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Need composite nitrogen and phosphorus samples to assess A&Wc and FBC		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria in at least 7 samples.
assess A&Wc and FBC DISCUSSION OF SITE SPECIFIC NUTRIENT STANDARDS		Nitrogen and phosphorus standards established for this take are based on composite samples collected at the surface, 2 meter, and 5 meter depths. No composite samples were collected and analyzed during this assessment period. This standard is to be replaced by the proposed lake narrative nutrient implementation procedures currently being adopted through the Triennial Review process. The nitrogen criterion (1.0 mg/L) was exceeded in 12 of 42 samples collected. However, since these were not composite samples, the	
MONITORING RECOMMENDATIONS		standards did not apply. High Priority—Collect more dissolved oxygen samples to support a TMDL. Low dissolved oxygen and high pH may be symptoms of excess nutrient loading. New methods for implementing the narrative nutries standard should be applied to this lake once adopted, to determine whether narrative nutrient violations are occurring based on the dissolved oxygen and pH violation, and elevated nutrients. Use lower lab detection limits for selenium and dissolved mercury.	

BEAR WALLOW CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From North and South Forks of Bear Wallow to Indian Reservation boundary 15060101 – 023A 5.9 Miles	A&Wc – Attaining FBC – Inconclusive FC – Attaining AgL – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 10/24/2001 – 08/15/2002			
DATABASE #		NUMBER AND TYPES OF SAM	MPLES		
		Metals	Nutrients - Related	Other	
Below South Fork Bear Wallow Creek SRBWL005.79 101198	ADEQ Ambient	3 dissolved and total metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, zinc 3 total and 0-1 dissolved: Boron, lead, manganese, mercury 1 total and 1 dissolved: barium, nickel, silver, and thallium	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 3 Fluoride 3 Total dissolved solids 3 Turbidity	

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient <i>E. coli</i> bacteria samples to assess FBC		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.
MONITORING RECOMMEND	DATIONS		bacteria samples to represent at least 3 t period. Use lower lab detection limits foury.

BEAVER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Black River 15060101 008 13.1 Miles	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining Agl – Attaining Agl. – Attaining	Category 2 Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 10/24/2001 – 10/26/2004					
DATABASE #		NUMBER AND TYPES OF SAM	NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients – Related	Other			
Above Forest Road #26 SRBEV012.04 102145	ADEQ Special study	3 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, copper, zinc	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen	3 <i>E. coli</i> bacteria 3 Fluoride 7 Total dissolved solids			
Above Hannagan Creek SRBEV009.66 102140	ADEQ Special study	3 total and 0-1 dissolved: Boron, lead, manganese, mercury	7 Phosphorus, dissolved oxygen, pH	22 Suspended sediment concentration 22 Turbidity			
Below Hannagan Creek SRBEV009.56 102139	ADEQ Special study	1 total and 1 dissolved: barium, nickel, silver, and thallium					
Above Forest Road 26 bridge SRBEV007.28 102135	ADEQ Special study						
At USGS Gage near Sprucedale SRBEV001.40 100373	ADEQ Ambient and Special study						

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	08/13/2002 – 6.74 mg/L 08/28/2003 – 5.56 mg/L	Inconclusive – On 08/13/2002 low dissolved oxygen was naturally occurring due to low flow (flow as 0.13) due to ground water upwelling. Nitrogen was 0.37, phosphorus = 0.18. Other date was during flood flow at 9 cfs, with phosphorus reading at 13 mg/L. (Binomial)
Phosphorus	0.8 mg/l. Single sample maximum A&Wc, FBC	08/27/2003 – 13 mg/L	Inconclusive – Only 1 exceedance in 7 samples. (Binomial)
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	08/27/2003 – 4865 mg/L	Attaining – SSC criteria of 80 mg/L was exceeded once in 22 sampling events. Because the sample was collected during flood flows of 9-10 cfs, the value could not be included in the geometric mean calculation. The geometric mean standard was not exceeded. However, the high sediment concentration suggests that sediment may be a problem in this watershed.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Phosphorus and dissolved oxygen	Core parameters collected.		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.
MONITORING RECOMMENDATIONS		samples due to exceedances. Use lower lab detection limit Recommend using biocriteria implementation procedures it to high levels of suspended s	is for selenium and dissolved oxygen assessments and bottom deposits in this reach, when they are adopted, due ediment during flood flows. Note that the TU) was exceeded during 8 of 22 sampling

BIG LAKE	USE SUPPORT	OVERALL ASSESSMENT	
15060101 0160 440 Acres	A&Wc – Inconclusive FBC – Inconclusive FC – Attaining DWS – Attaining Agl – Attaining AgL – Attaining	Category 2 Attaining some uses	

MONITORING	USED IN TH	IS ASSESSMENT			
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 11/15/2001 – 06/12/2002 NUMBER AND TYPES OF SAMPLES			
		At dam SRBIG-A 101322	ADEQ Ambient	3 dissolved and total metals: Antimony, arsenic, barium, boron, beryllium, chromium, selenium, zinc 3 total and 0-1 dissolved: Cadmium, copper, lead, silver, manganese, mercury	3-4 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH
Mid lake SRBIG-B 101355	ADEQ Ambient				
At boat dock SRBIG-D 100013	ADEQ Ambient				
Shoreline SRBIG-SH 101358	ADEQ Ambient				
West of floating dock SRBIG-SBR 101359	ADEQ Ambient				

EXCEEDANCES						
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS			
No Exceedances						

DATA GAPS AND MC	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient <i>E. coli</i> bacteria and dissolved cadmium and dissolved copper to assess FBC and A&Wc		Lab detection limits for dissolved metals (cadmium copper, lead, mercury, and silver) were higher than the A&W chronic criteria in at least 1 sample.
MONITORING RECOMMEN	DATIONS	Low Priority -Collect missing core parameters to represent at least 3 seasons during the assessment period. Use lower lab detection limits for dissolved metals.	

BLACK RIVER	USE SUPPORT	OVERALL ASSESSMENT
From Beaver Creek to Reservation Creek 15060101 – 007 13.1 Miles	A&Wc - Attaining FBC - Inconclusive FC - Attaining DWS - Attaining AgI - Attaining AgL - Attaining	Category 2 Attaining some uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 10/25/2001 – 08/14/2002			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above Forest Road #25 SRBLR102.24 101202	ADEQ Ambient	3 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 3 total 0-1 dissolved: Boron, manganese, lead, mercury 1 total, 1 dissolved Barium, nickel, silver, thallium	3 samples: Ammonia, dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen	2 E. coli bacteria 3 Fluoride 3 Total dissolved solids 3 Suspended sediment concentration 4 Turbidity	

EXCEEDANG	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient <i>E. coli</i> bacteria sample to assess FBC		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.
MONITORING RECOMMENI	DATIONS		bacteria samples to represent at least 3 t period. Use lower lab detection limits for ury

CAMPAIGN CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Pinto Creek 15060103 037	A&Ww – Attaining FBC – Attaining	Category 1	
16.6 Miles	FC – Attaining AgL – Attaining	Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 11/27/2001	- 09/11/2002		
DATABASE #		NUMBER AND TYPES OF SAM	NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other	
At Superstition Wilderness Boundary SRCGN009.78 100431	ADEQ Ambient	4 dissolved and total metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, zinc 4 total metals only: Boron, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity	

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters	15 A	Lab detection limit for selenium was higher than the A&W chronic criteria.
MONITORING RECOMMENT	DATIONS	Low Priority –Use lower lab	detection limits for selenium.

CANYON CREEK	USE SUPPORT	OVERALL ASSESSMENT
From headwaters to White Mountain Apache Reservation 15060103 014 8.6 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining DWS - Attaining AgI - Attaining AgL - Attaining	Category 1 Attaining all uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 12/18/2001 – 09/06/2002 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
Below OW Ranch Road \$RCYN046.07 100370	ADEQ Ambient	4 dissolved and total metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, zinc 4 total metals only: Boron, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium.	
	Collected all core parameters		Lab detection limit for selenium was higher than the A&W chronic criteria.
MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
DATA GAPS AND MO	NITORING NEEDS		

CANYON LAKE 15060106A 0250	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
450 Acres	A&Wc – Impaired FBC – Inconclusive FC – Attaining DWS Attaining AgI – Attaining AgL – Attaining	Category 5	Low dissolved oxygen	Added low dissolved oxygen to 303(d) List in 2004

MONITORING						
SITE NAMES ID #	PURPOSE	SAMPLING DATE: 07/11/2001 – 10/20/2004				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
	The state of the s	Metals	Nutrients - Related	Other		
At dam SRCAN-A 101697	ADEQ, AGFD, UA Ambient	7-11 total and 7 dissolved: Cadmium, chromium, copper, lead, nickel, silver, zinc	28-30 samples: Ammonia, total nitrogen, nitrite/nitrate, total	8 <i>E. coli</i> bacteria 16 Fluoride 6 Total dissolved solids		
At transition zone SRCAN-B 101699	ADEQ, UA Ambient	7 total and 0-2 dissolved: Antimony, arsenic, barium,	Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	11 Turbidity		
Inflow below Horse Mesa Dam SRAPA-1 102538	AGFD Ambient	beryllium, boron, manganese, selenium, mercury, thallium				
Canyon area SRCAN-CAN 102754	AGFD Ambient					
At campground SRCAN-CG1 101700	ADEQ, AGFD, UA Ambient					
At marina SRCAN-MAR 101701	UA Ambient					
Upper middle lake SRCAN-MID 102837	AGFD Ambient					

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
1022017411	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	SITES 10/15/2001 – 6.1 mg/L – A and 1 10/18/2002 – 6.7 mg/L – A 06/04/2003 – 4.5 mg/L – A and B 10/15/2003 – 4.4 mg/L – A 01/08/2004 – 5.0 mg/L – A and B 10/20/2004 – 4.2 mg/L – A and B	Impaired – Low dissolved oxygen in 10 of 23 samples in the top meter. (Binomial) Low DO during 6 of 12 sampling events. (Note: ADEQ has proposed changing the designated use at this lake to A&Ww, which has a dissolved oxygen standard of 6.0 mg/L. This would adjust the number of low dissolved oxygen samples to 5 of 23 samples (4 of 12 sampling events), and it would remain impaired.)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Need composite nitrogen and phosphorus samples to assess A&Wc and FBC		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria in at least 2 samples.
DISCUSSION OF SITE SPECIFIC N	UTRIENT STANDARDS	on composite samples col depths. No composite sar assessment period. This standard is to be replimplementation procedur Triennial Review process. The nitrogen criterion (1.0)	mg/L) was exceeded in 4 of 27 samples r. However, since these were not composite
MONITORING RECOMMENI	DATIONS	TMDL. Low dissolved ox loading. New methods fo standard should be applie	re dissolved oxygen samples to support a ygen may be a syinptom of excess nutrient in implementing the narrative nutrient at to this lake once adopted.

CHERRY CREEK	USE SUPPORT	OVERALL ASSESSMENT	
56004 to Salt River	A&Wc – Attaining FBC – Attaining FC – Attaining Agl Attaining AgL – Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 11/27/2001	- 09/10/2002		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Above road crossing SRCHE032.78 101323	ADEQ Ambient	8 dissolved and total metals: Antimony, arsenic, barium, beryllium, cadmium, chromium,	8 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen,	7 <i>E. coli</i> bacteria 8 Fluoride 8 Total dissolved solids	
Half-mile above Leisure Canyon	ADEQ Ambient	copper, zinc	total phosphorus, dissolved oxygen, pH	8 Turbidity	
SRCHE004.32		8 total metals only: Boron, lead, manganese, mercury			

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for selenium was higher than the A&W chronic criteria.
MONITORING RECOMMENT	DATIONS	Low Priority –Use a lower la	b detection limit for selenium.

CHRISTOPHER CREEK From headwaters to Tonto	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
Creek 15060105 – 353 8.0 Miles	A&Wc – Impaired FBC – Impaired FC – Attaining Agl – Attaining AgL – Attaining	Category 4A (E. coli) Not attaining (Impaired) Category 5 (phosphorus) Impaired	E. coli bacteria and phosphorus	Add phosphorus. E. coli TMDL was approved in 2005. Implementing strategies to reduce loadings.

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 05/23/200	00 – 10/25/2003			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Above recreation area SRCRS006.20 101027	ADEQ TMDL	3-4 total and dissolved metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 3-4 total metals only: Barium, boron, lead, manganese, mercury 1 total metals only: Nickel, silver, and thallium	95-102 samples: Total nitrogen, total phosphorus, total	68 <i>E. coli</i> bacteria 4 Fluoride 3 Total dissolved solids		
Below recreation area SRCRS005.68 101028	ADEQ TMDL		Kjeldahl nitrogen, dissolved oxygen, pH 4 samples: Ammonia	163 Suspended sediment concentration 72 Turbidity		
Above Highway 260 at Christopher Creek, AZ SRCRS004.43 100362	ADEQ TMDL					
Below Christopher Creek, AZ SRCRS002.97 101030	ADEQ TMDL					
Above Christopher Creek Campground SRCRS002.82 100364	ADEQ TMDL					
Below Christopher Creek Campground SRCRS002.25 100365	ADEQ TMDL					
At top of Box Canyon SRCRS001.24 101033	ADEQ TMDL					
Below Box Canyon SRCRS000.34 100367	ADEQ Ambient					
Above Tonto Creek SRCRS000.08 101034	ADEQ TMDL					

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Dissolved oxygen	7.0 mg/L A&Wc	05/24/2000 – 6.7 mg/L 09/05/2000 – 6.7 mg/L 05/08/2002 – 6.7 mg/L 06/10/2002 – 6.5 mg/L 07/24/2002 – 6.6 mg/L 07/23/2003 – 6.6 mg/L 08/20/2003 – 6.5 mg/L	Attaining –Low dissolved oxygen normally solely due to natural conditions of low flow and ground water upwelling. (Low flows between 0.03 – 0.5 cfs.) Lowest dissolved oxygen measurement was 6.5 mg/L, which is marginally below the standard.
E. coli bacteria	235 CFU/100 ml FBC	09/02/2000 – 689 CFU/100 ml 10/31/2000 – 479 CFU/100 ml 07/22/2003 – 1120 CFU/100 ml 08/20/2003 >2419 CFU/100 ml 10/08/2003 – 345 CFU/100 ml	Remains impaired – Exceeded criterion on 5 sampling events during the assessment period. Three exceedances in 2003. Exceedance on one date was associated with flood flows (20 cfs). Exceedances on two other dates were occurred during elevated flows (2-6 cfs).
Phosphorus	0.8 mg/L – Single sample max (SSM) 0.10 mg/L – Annual mean A&Wc and FBC	08/20/2003 - 3.5 mg/L (SSM) 2000 - 0.13 (annual mean) 2003 - 0.44 mg/L (annual mean)	Impaired – Annual mean was exceeded 2 different sites in 2003 and one site in 2000. Single sample maximum (1 mg/L) was exceeded only in 1 of 35 samples (binomial).
Suspended sediment concentration (SSC)	Geometric mean 80 mg/L A&Wc	08/06/2003 – 1603 mg/L 08/20/2003 – 702 mg/L 10/08/2003 – 92 mg/L	Attaining – 3 of 13 sampling events exceeded the 80 mg/L criterion. 1 exceedance occurred during elevated flows (702 mg/L at 5.6 cfs), so was not included in the geometric mean calculation. Using the remaining data, the geometric mean was not exceeded. Note that the old turbidity standard (10 NTU) was also exceeded during 9 sampling events.

MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
Collected all core parameters		Lab detection limit for selenium was higher than A&Wc chronic criteria.	
MONITORING RECOMMENDATIONS		to E. coli bacteria loadings will also reduce fore, development of a phosphorus TMDL is a onal phosphorus and E. coli bacteria data to TMDL strategies being implemented. imit for selenium.	
	MISSING CORE PARAMETERS Collected all core parameters	Collected all core parameters DATIONS Medium Priority – Actions to phosphorus loadings; there low priority. Collect additidetermine effectiveness of Use a lower lab detection like the phosphorus loadings.	

COON CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From tributary at 334642 / 1105425 to Salt River 15060103 039B 10.1 Miles	A&Ww - Attaining FBC - Attaining FC - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 11/27/2001	- 09/10/2002	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
At Forest Road #203 \$RCOO001.92 100379	ADEQ Ambient	4 dissolved and total metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, zinc 4 total metals only: Boron, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	4 E. coli bacteria 4 Fluoride 4 Total dissolved solid 4 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Collected all core parameters		Lab detection limit for selenium was higher than the A&W chronic criteria
MONITORING RECOMMENDATIONS		Low Priority –Use a lower la	b detection limit for selenium.

COTTONWOOD GULCH	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Pinto Creek 15060103 – 891 1.9 Miles	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIODS: 01/10/2000 – 0	SAMPLING PERIODS: 01/10/2000 – 07/16/2002; 04/05/2005		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
Below Outfall PV004 SRCTG000.39 103443	BHP Permit	9-19 dissolved and total metals: Arsenic, beryllium, cadmium, copper, magnesium, selenium, and zinc.	9 samples: Dissolved oxygen 19 samples: pH	9 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
,	Dissolved lead needed to assess attainment of A&We.		
MONITORING RECOMMENDATIONS		Low Priority - Collect core parameters to represent at least 3 seasons during the assessment period.	

CRESCENT LAKE 15060101 0420		USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
155 Acres	A D E Q	A&Wc - Inconclusive FBC - Inconclusive FC - Attaining AgI - Inconclusive AgL - Inconclusive	Category 2 Attaining Some Uses	- 1000 0 - 1000 0 - 1	
	E P A	A&Wc - Impaired FBC - Impaired AgI - Impaired AgL - Impaired (Affected uses only)	Category 5	High pH	EPA listed lake due to high pH in 2002

Light blue highlights indicate EPA impairments based on EPA assessment and listing criteria. This listing may change when EPA reviews and approves the 2006 impaired waters list. Such listings do not satisfy requirements established in Arizona's Impaired Water Identification Rule; therefore, they are not included in the list of Arizona's impaired waters (Appendix B and Appendix C).

SITE NAMES AGENCY		SAMPLING DATE: 11/14/2001 – 06/12/2002		
ID#	PURPOSE	NUMBER AND TYPES OF SAMPLES		
DATABASE #		Metals	Nutrients – Related	Other
Mid lake SRCRE-B 100993	ADEQ Ambient	3 dissolved and total metals: Antimony, arsenic, barium, boron, beryllium, chromium,	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen,	3 E. coli bacteria 3 Fluoride 4 Total dissolved solide
At boat ramp SRCRE-BR 101320	ADEQ Ambient	manganese, nickel, silver, selenium, zinc 3 total and 0-2 dissolved: Cadmium, copper, lead, mercury	total phosphorus, dissolved oxygen, pH	2 Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
pH	<9.0 SU A&Wc, FBC, Agl, AgL	11/14/2001 – 9.6 SU	Inconclusive – 1 exceedance in 3 samples. (EPA's original listing considered older data.)

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC	NITORING NEED	S		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Insufficient dissolved cadmium and dissolved copper to assess A&Wc		Lab detection limits for dissolved metals (cadmium, copper, lead, and mercury) were higher than the A&W chronic criteria in at least 1 sample.	
DISCUSSION OF HIGH PH IMPAIRMENT		Evidence of potential impairment: No newer monitoring data since lake was listed as impaired.		
MONITORING RECOMMENDATIONS		TMDL. High pH may be a st methods for implementing t	neasurements to support development of a ymptom of excess nutrient loading. New the narrative nutrient standard should be applied to determine whether narrative nutrient	
		Collect missing core parame Use lower lab detection limit	ters to represent at least 3 seasons. its for dissolved metals.	

DEER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Rye Creek 15060105 018 11.9 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining	Category I Attaining all uses	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIOD: 01/10/2002 – 04/23/2002				
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
Above Mazatzal Wilderness Boundary SRD4E005.86 100531	ADEQ Ambient	3 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 3 total metals only: Boron, lead, manganese, mercury	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	3 E. coli bacteria 3 Fluoride 3 Total dissolved solids 3 Turbidity		

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Pollutant: Assume "total" concentration, unless shown as dissolved.

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

MONITORING RECOMMEN	DATIONS	Low Priority –Use a lower la	b detection limit for selenium.
	Collected all core parameters		Lab detection limits for selenium was higher than the A&W chronic criteria
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH

EAST FORK BLACK RIVER	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Black River 15060101 009 26.7 Miles	A&Wc - Attaining FBC - Attaining FC - Attaining DWS - Attaining Agl - Attaining AgL - Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 10/24/2001 – 11/19/2003 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
Below the three Black River forks SREFB011.86 101203	ADEQ Special study	8 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, copper, zinc	8 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved	8 <i>E. coli</i> bacteria 8 Fluoride 8 Total dissolved solids 4 Suspended sediment
Above old Buffalo Crossing bridge SREFB000.91 100375	ADEQ Special study	8 total and 0-2 dissolved: Boron, lead, manganese, mercury	oxygen, pH	concentration 12 Turbidity
Below Forest Road 24 at USGS gage SREFB000.62 102131	ADEQ Special study	2 total and 2 dissolved: barium, nickel, silver, and thallium		

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MO	NITORING NEEDS		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Core parameters collected.		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority –Use lower lab mercury.	detection limits for selenium and dissolved

ELLIS RANCH TRIBUTARY	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Pinto Creek 15060103 – 888 1 Mile	A&We –Inconclusive PBC – Inconclusive	Category 3	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 03/05/2004 – 01/12/2005		
DATABASE #	* NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other
Above Forest Road #349 SRERTOOO.48 102647	ADEQ TMDL	27 dissolved and 5 total: Copper 5 total and 5 dissolved: Selenium and zinc		
At Forest Road #349 SRERT000.10 102648	ADEQ TMDL	4 pH		

EXCEEDANCE	S		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	5.8 µg/L at 23 mg/L hardness 5.8 µg/L at 23 mg/L hardness 7.5 µg/L at 30 mg/L hardness A&We acute	12/29/2004 – 36 μg/L 01/04/2005 – 67 μg/L 01/12/2005 – 37 μg/L	Attaining –Field investigations for the Pinto Creek TMDL have concluded that copper loads are entirely due to natural background conditions. Exceedances entirely due to natural background are not violations of copper criteria and are not used to list a surface water as impaired. This data was used to develop a site-specific standard for Pinto Creek.
Low pH	>6.5 SU A&We, PBC	03/05/2004 – 6.1 SU	Inconclusive – Did not meet standards in 1 of 4 samples. (Binomial)

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MO	NITORING NEEDS	S		
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
рН	Missing most core parameters	Insufficient sampling events	Lab detection limits for selenium was higher than the A&W chronic criteria.	
MONITORING RECOMMENDATIONS		Medium Priority – Collect pH measurements due to the low pH value. Collect missing core parameters to represent at least 3 seasons during an assessment period. Use lower detection limits for selenium and dissolved mercury.		

FISH CREEK	USE SUPPORT	OVERALL ASSESSMENT	
I I OIII II COOTTO CO DIOCK INTE	A&Wc - Attaining FBC - Inconclusive FC - Attaining Agl Attaining AgL - Attaining	Attaining some uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 10/25/2001		
DATABASE #		NUMBER AND TYPES OF SAM	APLES	
		Metals	Nutrients - Related	Other
Above Black River SRFISO00.01 101200	ADEQ Ambient	3 dissolved and total metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, zinc 3 total and 0-1 dissolved: Boron, lead, manganese, mercury 1 total and 1 dissolved: barium, nickel, silver, and thallium	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	2 <i>E. coli</i> bacteria 3 Fluoride 3 Total dissolved solids 3 Turbidity

POLLUTANT	STANDARD UNIT	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances	DESIGNATED USES		

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
1-	Insufficient E. coll bacteria samples		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.	
MONITORING RECOMMENDATIONS		Low Priority – Collect <i>E. coli</i> bacteria samples to represent at least 3 seasons during the assessment period. Use lower lab detection limits fo selenium and dissolved mercury.		

FIVE POINT MOUNTAIN TRIBUTARY	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
From headwaters to Pinto Creek 15060103 – 885 2.9 Miles	A&We – Impaired PBC – Inconclusive	Category 5	Copper	Add copper to 303(d) List. (see discussion below)

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 03/30/200	1 – 01/04/2005		
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
At 60W3 ** SRFPM002.24 102657	ADEQ TMDL	6 total and dissolved: Copper 5 total and dissolved: Selenium,	None	1 Fluoride	
Below unnamed mine SRFPM001.69 102658	ADEQ TMDL	and zinc 1 dissolved and total metals:			
Above Bronx Mine \$RFPM000.99 102659	ADEQ TMDL	Antimony, arsenic, barium, beryllium, boron, cadmium, chromium, lead, manganese,			
Below Bronx Mine SRFPM000.90 102660	ADEQ TMDL	mercury, nickel, silver, thallium 6 pH			

^{** 60}W3 was a natural background site located above any mining or other anthropogenic disturbances.

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	12.5 µg/L at 52 mg/L hardness 7.0 µg/L at 28 mg/L hardness 8.6 µg/L at 35 mg/L hardness 7.7 µg/L at 31 mg/L hardness 5.6 µg/L at 22 mg/L hardness 4.4 µg/L at 17 mg/L hardness A&We acute	03/30/2001 – 380 μg/L 02/26/2003 – 45 μg/L 03/04/2003 – 100 μg/L *(02/23/2004 – 62 μg/L) *(12/29/2004 – 72 μg/L) *(01/04/2005 – 46 μg/L)	Impaired – 3 exceedances within a 3-year period (6 exceedances during the assessment period). * These three exceedances occurred at the natural background site, and were not used in determining impairment.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.	
DISCUSSION OF EXCEEDANCES		Samples were collected to support the Pinto Creek copper TMDL and site specific copper standard development. Copper loadings from this tributary will be addressed in the Pinto Creek copper TMDL currently being developed.		
MONITORING RECOMMENDATIONS		High Priority –Collect additional samples to support TMDL development as needed.		
		Use lower detection limits fo	or selenium and dissolved mercury.	

GIBSON MINE TRIBUTARY	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
III brown hoadwaters to Uinto	A&Ww – Impaired FBC – Inconclusive FC Inconclusive	Category 5	Copper	Add copper to 303(d) List. (Moving from Category 4A to Category 5 until Phase II is completed.) (See discussion below)

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 10/22/2000 – 03/	05/2004	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
At Pinto Creek SRGIB000.11 101071	ADEQ TMDL	31-50 dissolved and total metals: Copper and zinc 1 dissolved and total metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, lead, manganese, mercury, nickel, silver, thallium	4 samples: Dissolved oxygen 17 pH	1 Fluoride 1 Turbidity

POLLUTANT	STANDARD	DATES	DESIGNATED USE SUPPORT
	UNIT DESIGNATED USES	EXCEEDANCES	SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	4.9 µg/L at 34 mg/L hardness 9.1 µg/L at 66 mg/L hardness 9.3 µg/L at 68 mg/L hardness 78 µg/L at 56 mg/L hardness 12.2 µg/L at 90 mg/L hardness 14.7 µg/L at 110 mg/L hardness 5.5 µg/L at 39 mg/L hardness 6.6 µg/L at 47 mg/L hardness 15.4 µg/L at 140 mg/L hardness 7.5 µg/L at 54 mg/L hardness A&Ww acute	03/05/2004 – 2,400 μg/L 08/26/2003 – 4,200 μg/L 03/04/2003 – 7,000 μg/L 02/27/2003 – 7,400 μg/L 02/15/2003 – 6,000 μg/L 03/30/2001 – 2,300 μg/L 03/08/2001 – 2,100 μg/L 02/16/2001 – 2,500 μg/L 01/12/2001 – 5,600 μg/L 10/22/2000 – 5,900 μg/L	Impaired – Exceeded standards during all 10 monitoring periods – 9 exceedances in the last 3 years of monitoring.
Low pH	>6.5 SU A&Ww, FBC	03/05/2004 - 6.0 SU 08/26/2003 - 5.7 SU 03/04/2003 - 6.2 SU 02/27/2003 - 6.0 SU 02/15/2003 - 5.7 SU 03/08/2001 - 6.4 SU 01/12/2001 - 5.9 SU 10/22/2000 - 5.4 SU	Inconclusive – Did not meet standards in 8 of 10 sampling events (13 of 17 samples). Binomial method requires a minimum of 5 exceedances and 20 samples to list as impaired. (See discussion below)

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MO	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
pH	Missing most core parameters		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.
DISCUSSION OF EXCEEDANCES		Gibson Mine tributary is heavily impacted by mining activities; however, aggressing remediation activities are currently trying to address this contamination. Copper loadings from this tributary will be addressed in the Pinto Creek copper TMDL currently being developed.	
MONITORING RECOMMENDATIONS		High Priority –Collect addition needed. Use lower detection li	al samples to support TMDL development as mits for selenium and dissolved mercury.

GOLD GULCH	USE SUPPORT	OVERALL ASSESSMENT	
I TOTT TICGOTTO TO THE CITCEN	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING PERIODS: 01/06/2000 – 04/03/2005		
DATABASE #		NUMBER AND TYPES OF SAMPLES		
	Metals	Nutrients - Related	Other	
North of #3 tailing impoundment SRGDG000.21 103442	BHP Permit	33 total and 3 dissolved metals: Copper, selenium, zinc 23-33 total metals only: Arsenic,	21 samples: Dissolved oxygen 42 samples: pH	30 Turbidity
At weir SRGDG000.03 102666	BHP Permit	beryllium, cadmium, and magnesium		

EXCEEDANCES					
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS		
No Exceedances					

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Need dissolved lead to assess A&We.		Lab detection limit for selenium was higher than A&W chronic criteria.
DISCUSSION OF EXCEEDANCES		Samples were collected to support the Pinto Creek copper TMDL and site specific copper standard development. Copper loadings from this tributary will be addressed in the Pinto Creek copper TMDL currently being developed.	
MONITORING RECOMMENDATIONS		High Priority -Collect additional development as needed.	onal samples to support TMDL
			ters to represent at least 3 seasons during lower detection limits for selenium.

GREENBACK CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Tonto Creek 15060105 005	FBC - Attaining	Category 1	
16.4 Miles	FC – Attaining AgL – Attaining	Attaining all uses	

SITE NAMES AGENCY ID # PURPOSE DATABASE #		SAMPLING PERIOD: 11/28/2	001 – 05/08/2002	
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
Below Conway Ranch \$RGRE009.81 101221	ADEQ Ambient	3 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, copper, zinc 3 total and 0-2 dissolved: Boron, lead, manganese, mercury	3 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	3 E. coli bacteria 3 Fluoride 3 Total dissolved solids 3 Turbidity

EXCEEDANCES					
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS		
No Exceedances			·		

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Core parameters collected.		Lab detection limit for selenium was higher than the A&W chronic criteria
MONITORING RECOMMENDATIONS		Low Priority –Use a lower lab detection limit for selenium.	

HAIGLER CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to unnamed tributary at 341223 / 1110011 15060105 – 012A 15.4 Miles	A&Wc – Attaining FBC – Attaining FC – Attaining Agl Attaining AgL – Attaining	Category 1 Attaining all uses	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 12/18/2001 – 08/29/2002 NUMBER AND TYPES OF SAMPLES			
DATABASE #					
	1	Metals	Nutrients - Related	Other	
Near Boy Scout Camp SRHAG009.01 100372	ADEQ Ambient	4 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, zinc 4 total metals only: Boron, lead, manganese, mercury	4 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus, dissolved oxygen, pH	3 <i>E. coli</i> bacteria 4 Fluoride 4 Total dissolved solids 4 Turbidity	

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

MONITORING RECOMMENDATIONS		Low Priority –Use a lower la	ab detection limit for selenium.
	Core parameters collected.		Lab detection limit for selenium was higher than the A&W chronic criteria
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH

HANNAGAN CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Beaver Creek 15060101 034 7.2 Miles	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

MONITORING	USED IN TH			
SITE NAMES ID # DATABASE #	AGENCY PURPOSE	SAMPLING DATE: 04/09/2002 – 03/23/2004		
		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
At Highway 181 SRHAN002.27 102149	ADEQ Ambient		5-7 samples: Total phosphorus, dissolved oxygen, pH	7 Total dissolved solids 4 Suspended sediment concentration
Above Beaver Creek SRHAN000.06 102141	ADEQ Ambient			4 Turbidity

POLLUTANT	STANDARD UNIT	DATES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
	DESIGNATED USES		
Dissolved oxygen	7.0 mg/L A&Wc	06/20/2003 – 6.2 mg/L	Attaining Low dissolved oxygen due to natural conditions of low flow and ground water upwelling. Flow at 0.05 cfs. Nutrient tested showed low concentration (phosphorus 0.068 mg/L).
Phosphorus	0.8 mg/L Single sample maximum A&Wc, FBC	08/27/2003 – 6.2 mg/L	Inconclusive – Only 1 exceedance in 7 samples. (Binomial) Occurred during very high flow (10.3 cfs)
Suspended sediment concentration	Geometric mean 80 mg/L A&Wc	08/27/2003 – 3,500 mg/L 03/10/2004 – 95 mg/L 03/23/2004 – 135 mg/L	Attaining – Exceeded 80 mg/L on 3 of 7 monitoring events. Two of the results were not included in the geometric mean calculation, because flows were elevated (3,500 mg/L and 135 mg/L). Using the remaining samples, the geometric mean standard was not exceeded.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Phosphorus	Insufficient core parameters		
MONITORING RECOMMENDATIONS		concentration data due to ex Recommend using biocriteria implementation procedures to high levels of suspended s	a assessments and bottom deposits in this reach, when they are adopted, due

HAUNTED CANYON	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Pinto Creek 15060103 – 879 6.8 Miles	A&Ww - Inconclusive FBC - Attaining FC - Attaining	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 03/23/200	0 – 01/14/2005	
DATABASE #		NUMBER AND TYPES OF SAM	SAMPLES	
		Metals	Nutrients - Related	Other
Below Powers Gulch SRHNC000.45 101131 At Carlota Weir SRHNC000.14	ADEQ Ambient And TMDL ADEQ TMDL	19 total and 61 dissolved: Copper 3-15 total and dissolved: Antimony, arsenic, barium,	5-7 samples: Ammonia, total nitrogen, nitrite/nitrate, total Kjeldahl nitrogen, total phosphorus	4 <i>E. coli</i> bacteria 9 Fluoride 5 Total dissolved solids 6 Turbidity
101072	IMOL	beryllium, cadmium, chromium, lead, nickel, selenium, silver, thallium, zinc	10 Dissolved oxygen, 26 pH	
		8 total and 0-2 dissolved:		
		Boron, manganese, mercury		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	7.6 µg/L at 55 mg/L hardness 13.2 µg/L at 98 mg/L hardness A&Ww acute	12/30/2004 – 22 μg/L 03/10/2004 – 17 μg/L	Inconclusive – ADEQ will collect further monitoring because weight-of-evidence does not support listing this reach as impaired. (See discussion below)

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING	MISSING CORE PARAMETERS	MISSING SEASONAL	DETECTION LIMITS NOT LOW	
MORE SAMPLES TO ASSESS		DISTRIBUTION	ENOUGH	
	Collected all core parameters		Lab detection limits for selenium and dissolved mercury were higher than the A&W chronic criteria.	
DISCUSSION OF COPPER EXCE		for a margin of er on 03/10/2004 co be an exceedances five samples colle Gulch) were below copper ore body the exceedances of due to natural collegations sample on 03/10/ than 1 cfs), which represented natural	are based on calculated hardness. Allowing ror in the analysis, the acute copper criteria ould be as high as $17 \mu g/L$, which would not occurred at the Carlota Weir; however, all cted 3/10 mile upstream (below Power w the lab reporting limit of $10 \mu g/L$. A rich is known to exist near the lower site where occurred; therefore the exceedances may be additions (not a violation of standards). The 2004 was collected during low flow (less further supports the proposal that it al background for this site.	
MONITORING RECOMMENDATIONS		Medium Priority – Collect copper data to support Phase II copper TMDL. Use lower lab detection limits for selenium and dissolved mercury.		

HAY CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to West Fork Black River 15060101 – 353 4.5 Miles Unique Water	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgL - Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING PERIOD: 11/15/200	01-05/05/2004	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients - Related	Other
In Exclusion area SRHAY003.25 102121	ADEQ Special study	2 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, chromium, copper,	2 samples: Ammonia, dissolved oxygen, pH, total nitrogen, total phosphorus,	1 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solids
Above West Fork Black River SRHAY000.04	ADEQ Ambient and Special Study	zinc 2 total and 0-1 dissolved: Boron,	nitrite/nitrate, total Kjeldahl nitrogen	8 Suspended sediment concentration 8 Turbidity
101299	,	lead, manganese, mercury		

POLLUTANT	STANDARD UNIT	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances	DESIGNATED USES		

DATA GAPS AND MOI		Luccuse ericosis	I DETECTION IN ACT NOT LOW
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameters	Insufficient sampling events	Lab detection limit for selenium is higher than A&Wc chronic criteria.
MONITORING RECOMMEND	PATIONS		ameters to represent at least 3 seasons Use a lower lab detection limit for

HOME CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to West Fork Black River 15060101 339 9.1 Miles	A&Wc - Inconclusive FBC - Inconclusive FC - Inconclusive AgL - Inconclusive	Category 3	

SITE NAMES AGENCY ID # PURPOSE		SAMPLING DATE: 04/16/2003 – 03/23/2004			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients – Related	Other	
Above fish barrier SRHOM001.01 102128	ADEQ Special study		1 sample: Total phosphorus, 4 samples: Dissolved	2 Total dissolved solids 6 Suspended sediment concentration	
Above West Fork Black River SRHOM000.02 102129	ADEQ Special study		oxygen and pH	6 Turbidity	

EXCEEDANC	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

DATA GAPS AND MC EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
	Insufficient core parameters	Insufficient sampling events	
MONITORING RECOMMEN	DATIONS	Low Priority -Collect core para during the assessment period.	ameters to represent at least 3 seasons

HORTON CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Beaver Creek 15060101 036 4.6 Miles	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive	Category 3	

SITE NAMES ID#	AGENCY PURPOSE	SAMPLING DATE: 04/15/2003 – 03/23/2004 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
Above Forest Road #26 SRHRT002.27 102149	ADEQ Ambient		2 samples: Total phosphorus, dissolved oxygen, pH	Total dissolved solid: Suspended sediment concentration Turbidity

EXCEEDANG	CES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
-	Insufficient core parameters	Insufficient sampling events	
MONITORING RECOMMEND	PATIONS	Low Priority -Collect core para during the assessment period.	ameters to represent at least 3 seasons

JK MOUNTAIN TRIBUTARY	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to West Fork Pinto Creek 15060103 – 873 1.1 Miles	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive	

MONITORING U	SED IN THI	S ASSESSMENT		
SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 03/05/2004; 01/04/2005 NUMBER AND TYPES OF SAMPLES		
DATABASE #				
		Metals	Nutrients – Related	Other
Above West Fork Pinto	ADEQ	2 dissolved and total metals:		
Creek	TMDL	Copper, selenium, zinc		l i
SRJKM000.22 102668		2 pH		

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	9.1 µg/L at 37 mg/L hardness 13.9 µg/L at 58 mg/L hardness A&We acute	01/04/2005 – 18 μg/L 03/05/2004 – 28 μg/L	Attaining –Field investigations for the Pinto Creek TMDL have concluded that copper loads are entirely due to natural background conditions. Exceedances entirely due to natural background are not violations of copper criteria and are not used to list a surface water as impaired. This data was used to develop a site-specific standard for Pinto Creek.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
-	Insufficient core parameter	Insufficient sampling events	Lab detection limit for selenium was higher than A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority -Collect core parameters to represent at least 3 season during an assessment period.	
		Use lower detection limits fo	r selenium.

MEAD CANYON	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Pinto Creek 15060103 – 889 2.4 Miles	A&We – Inconclusive PBC – Inconclusive	Category 3 Inconclusive	

SITE NAMES AGENCY ID # PURPOSE DATABASE #		SAMPLING DATES: 03/05/2004; 12/30/2004 NUMBER AND TYPES OF SAMPLES		
Below MF Ranch SRMEC001.13 102655	ADEQ TMDL	2 dissolved and total metals: Copper and zinc 2 pH		
At Forest Road #349 SRMEC000.53 102656	ADEQ TMDL			

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper (dissolved)	14.2 µg/L at 59 mg/L hardness 9.3 µg/L at 38 mg/L hardness A&We acute	03/05/2004 – 22 μg/L 12/30/2004 – 67 μg/L	Attaining –Field investigations for the Pinto Creek TMDL have concluded that copper loads are entirely due to natural background conditions. Exceedances entirely due to natural background are not violations of copper criteria and are not used to list a surface water as impaired. This data was used to develop a site-specific standard for Pinto Creek.
Low pH	>6.5 SU A&We, PBC	03/05/2004 - 5.3 SU	Inconclusive – Did not meet standards in 1 of 2 sampling events. (Binomial)

EXCEEDANCES NEEDING	MISSING CORE	MISSING SEASONAL	DETECTION LIMITS NOT LOW
MORE SAMPLES TO ASSESS	PARAMETERS	DISTRIBUTION	ENOUGH
рН	Insufficient core parameters	Insufficient sampling events	Lab detection limit for selenium was higher than the A&W chronic criteria
MONITORING RECOMMEND	DATIONS	Medium Priority -Collect pH s	amples due to the low pH value.
		Collect core parameters to rep assessment period. Use a lowe	resent at least 3 seasons during an r detection limit for selenium.

NORTH FORK BEAR WALLOW CREEK	USE SUPPORT	OVERALL ASSESSMENT	
From headwaters to Bear Wallow Creek 15060101 – 022 5.2 Miles Unique Water	A&Wc – Inconclusive FBC – Inconclusive FC – Inconclusive AgL – Inconclusive	Category 3 Inconclusive	

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATES: 11/14/2001	; 06/11/2002	
DATABASE #		NUMBER AND TYPES OF SAMPLES		
		Metals	Nutrients – Related	Other
Just above South Fork Bear Wallow Creek SRNBE000.10 101262	ADEQ Ambient	2 dissolved and total metals: Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, manganese, mercury, zinc 2 total and 0-1 dissolved: Boron, lead, manganese, mercury	2 samples: Ammonia, dissolved oxygen, pH, total nitrogen, total phosphorus, nitrite/nitrate, total Kjeldahl nitrogen	2 <i>E. coli</i> bacteria 2 Fluoride 2 Total dissolved solids 2 Turbidity

POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
No Exceedances			

Frequency Exceed = Samples collected within a 7-day period are aggregated and counted as one sample per site.

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
	Insufficient core parameter	Insufficient sampling events	Lab detection limit for selenium was higher than the A&W chronic criteria.
MONITORING RECOMMENDATIONS		Low Priority -Collect core parameters to represent at least 3 seasons during the assessment period. Use a lower lab detection limit for the selenium.	

PINAL CREEK	USE SUPPORT	OVERALL ASSESSMENT
From Lower Pinal Creek WTP discharge to Salt River 15060103 – 280D 6.4 Miles	A&Ww - Inconclusive FBC - Attaining FC - Attaining Agl - Attaining Agl Attaining	Category 2 Attaining some uses

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 02/16/2000 -	- 04/28/2005			
DATABASE #		NUMBER AND TYPES OF SAMPLES				
		Metals	Nutrients - Related	Other		
At Setka Ranch SRPNL006.87 101491 At site Z2.2	USGS Pinal Group Effectiveness USGS	93-173 total and dissolved metals: Beryllium, cadmium, chromium, copper, manganese, nickel, zinc	22 samples: Ammonia, total nitrogen, total phosphorus, nitrite/nitrate, total	22 E. coli bacteria 11 Fluoride 8 Total dissolved solids 22 Suspended sediment		
SRPNL006.70 101503	Special study	25-60 total and dissolved metals: Antimony, arsenic, barium, boron,	Kjeldahl nitrogen 109 Dissolved oxygen 273 pH	concentration 22 Turbidity		
At site Z4 SRPNL006.62 101504	USGS Special study	lead, thallium,				
At site Z4.3 SRPNL006.54 101505	USGS Special study	Selenium, silver 25 total and 4 dissolved: Mercury				
At site Z4.7 SRPNL006.49 101507	USGS Special study					
At site Z5 SRPNL006.41 101509	USGS Special study					
At site Z5.7 SRPNL006.24 101510	USGS Special study					
At site Z6.2 SRPNL006.17 101511	USGS Special study					
At site Z7 SRPNL005.96 101513	USGS Special study					
At USGS site SRPNL005.82 101515	USGS Special study					
At size Z9A SRPNL005.65 101516	USGS Special study					
At site Z105W SRPNL005.51 102171	USGS Special study					
At site JJ15 SRPNL005.12 101518	USGS Pinal Group Effectiveness					
At Inspiration Dam SRPNL003.79 100727	USGS Pinal Group Effectiveness					

EXCEEDANC	ES		
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Excluded metals e	exceedances and low pH values be	fore treatment initiated in	2001
Cadmium (dissolved)	6.22 µg/L at >400 mg/L hardness A&Ww chronic	07/14/2004 – 7.0 μg/L	Inconclusive – One exceedance the assessment period. Occurred during normal flow.
Chromium	100 μg/L FBC	12/08/2004 – 140	Attaining – Only 1 exceedance in 70 samples (Binomial)
Dissolved oxygen	6.0 mg/L A&Ww	06/13/2000 - 4.7 mg/L 08/20/2000 - 5.5 mg/L 10/17/2000 - 5.5 mg/L 01/25/2001 - 4.8 mg/L 04/05/2001 - 1.7 mg/L 06/12/2001 - 5.5 mg/L 08/07/2001 - 3.8 mg/L 01/16/2002 - 5.4 mg/L 05/27/2003 - 4.0 mg/L 05/18/2004 - 5.4 mg/L	Attaining Low dissolved oxygen due to natural conditions of ground water upwelling in the area.
рН	>6.5 SU A&Ww, FBC, AgL	05/27/2003 - 6.4 SU	Attaining – Surface water treatment in 2001. Only 1 low pH in 63 monitoring events. (Binomial)
Zinc (dissolved)	232 μg/L at 224 mg/L hardness 379.3 μg/L at >400 μg/L hardness A&Ww acute	08/26/2003 – 5,100 μg/L	Inconclusive – Only lexceedanceduring the last 3 years of monitoring.

DATA GAPS AND MC	NITORING NEE	DS	
EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH
Dissolved cadmium and dissolved zinc	Collected all core parameters		Lab detection limits for dissolved metals (beryllium, cadmium, chromium, copper, mercury, nickel, silver, and zinc) and selenium were higher than A&W criteria in at least 6 samples.
MONITORING RECOMMENDATIONS		Medium Priority —Collect additional dissolved cadmium and dissolved zinc samples due to exceedances. Use lower lab detection limits for dissolved metals and total selenium.	

PINTO CREEK From headwaters to unnamed	USE SUPPORT	OVERALL ASSESSMENT	POLLUTANTS CAUSING IMPAIRMENT	IMPAIRMENT STATUS
tributary at 331927 / 1105456 15060103 - 018A 2.5 Miles	A&Ww - Impaired FBC - Inconclusive FC - Inconclusive AgI - Inconclusive AgL - Inconclusive	Category 5	Copper	Conducting a Phase II copper TMDL. (Moving from Category 4A to 5 while completing Phase II Copper TMDL)

SITE NAMES ID #	AGENCY PURPOSE	SAMPLING DATE: 02/16/2001 - 03/05/2004			
DATABASE #		NUMBER AND TYPES OF SAMPLES			
		Metals	Nutrients - Related	Other	
At Simpson Dam SRPNT033.02 102428	ADEQ Ambient	7 dissolved and 6 total copper 2 total and 3 dissolved zinc 7 pH	2 samples: Dissolved oxygen and pH		

EXCEEDAN			
POLLUTANT	STANDARD UNIT DESIGNATED USES	DATES EXCEEDANCES	DESIGNATED USE SUPPORT SUPPORTING EVIDENCE AND COMMENTS
Copper	500 μg/L AgL	08/26/2003 – 1300 μg/L 03/05/2004 – 1000 μg/L	Remains impaired – 2 exceedances in 6 samples.
Copper (dissolved)	5.7 µg/L at 40 mg/L hardness 16.0 µg/L at 120 mg/L hardness A&Ww acute	02/27/2003 – 16 μg/L 03/05/2004 – 18 μg/L	Remains impaired – 2 exceedances in the last 3 years of monitoring
pН	>6.5 µg/L A&W/w, FBC, AgL	08/26/2003 – 5.9 μg/L 03/05/2004 – 5.7 μg/L	Inconclusive - Only 2 exceedances in 6 sampling events. (Binomial method requires a minimum of 5 exceedances and 20 samples to assess as impaired.)

EXCEEDANCES NEEDING MORE SAMPLES TO ASSESS	MISSING CORE PARAMETERS	MISSING SEASONAL DISTRIBUTION	DETECTION LIMITS NOT LOW ENOUGH	
рН	Insufficient core parameters		Lab detection limit for selenium was higher than the A&W chronic criteria.	
MONITORING RECOMMENDATIONS		High Priority —Collect copper samples to support development of the Phase II copper TMDL and site specific copper standards.		
		Collect additional pH samples due to exceedances.		
		Use a lower lab detection limit for selenium.		